A TRANS-DISCIPLINARY ANALYSIS

OF

INTERNATIONAL ENVIRONMENTAL POLICY:

THE CORAL REEF CRISIS

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by

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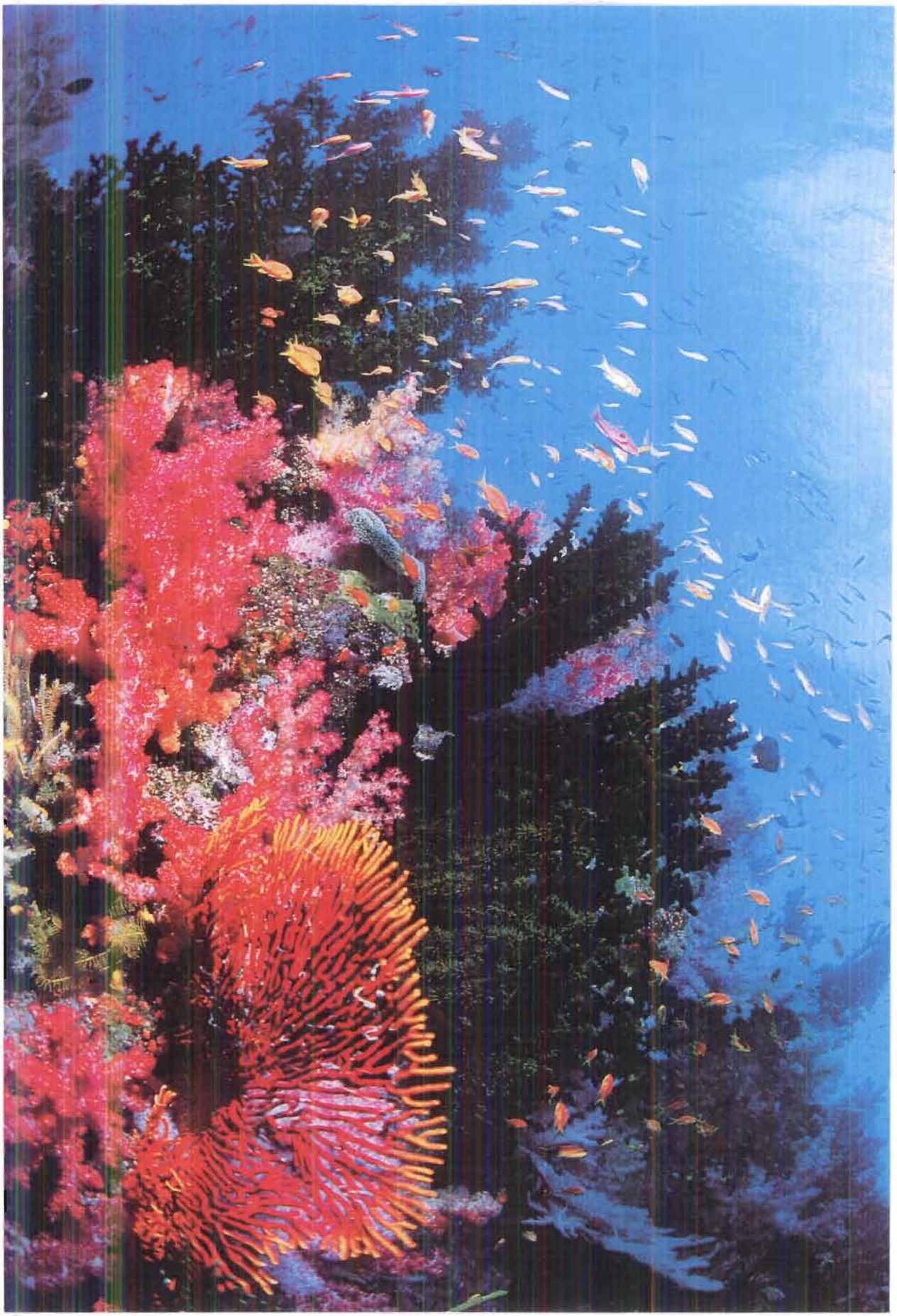
Frontispiece: Coral reef, Somosomo Strait, Fiji Islands

Reproduced from *Fiji The Uncharted Sea*, Federico Busonero 1996



I am always bothered by the Western arrogance, by its assurance that it knows all the answers and can quite readily fix everything so that the tropical peoples can live happily ever after, if only they will listen. This philosophy underlies all of the various programs of international technical assistance that are so popular these days, and especially the programs of the United States which are aimed at the uplift of practically everybody else

Marston Bates in *Where winter never comes: a study of man and nature in the tropics* (1950)

All critical examinations of the relations to nature are simultaneously critical examinations of society

David Harvey in *Justice, nature and the geography of difference* (1996)

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Abstract

Focusing on coral reef policy, this thesis challenges orthodox understanding of international environmental policy, studying environmental crises as political assemblies, and policy endeavours as power-filled networks. This requires first rendering the subject accessible for critical research by constructing a 'multiperspectival' base from which to view it, thus elucidating how a Foucauldian discourse of modernisation hides the politics of orthodox understandings of international environmental policy. The thesis then investigates the efforts of a suite of science/policy/conservation agencies to save coral reefs from a perceived global crisis. It analyses how coral reef policy arises as an instrument of international governance, articulating with the Fiji Islands, a South Pacific archipelago. This reveals how global truths are created and translated into policies and action plans, enrolling places and people into a global network largely outside the formal interstate treaty system. Understanding these networks and the various modes of power operating within them—from seduction to coercion and hegemony—necessitates understanding how actors in both developed and developing counties exhibit similar agency, co-opting discourses to suit their interests.

The final section argues that this political assembly around ecological crisis represents a deepening integration of humankind in which ecology has become a model for the practice of development under the control of ecological technocrats. The West continues to dominate the Third World, however. Both environmental policy discourse and the universals through which policy travels the globe—the moral imperative to look after the planet plus science-based universals positioning coral reefs as a problem of common concern to humanity—contribute to this relationship of domination. Indeed, hegemony is predicated upon the universal of international cooperation as much as those of science and neoliberalism. Technical practices and expert technologies accepted as commonsense help sustain an asymmetrical relationship; practices used in creating global reports of coral health, capacity-building projects, ecoregion planning technologies and the rhetorical style used in scientific papers all contribute.

Abbreviations and Acronyms

ADB	Asian Development Bank
AFD	Agence Française de Développement (French Development Agency)
AOSIS	Alliance of Small Island States
ASPEI	Association of South Pacific Environmental Institutions
BCN	Biodiversity Conservation Network
BPoA+10	Barbados Programme of Action Plus Ten (years)
BSP	Biodiversity Support Programme
CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CoP	Conference of the Parties
CPC	[ICRI's] Executive Planning Committee
CRISP	Coral Reef Initiative for the Pacific
CNRS	Centre National de la Recherche Scientifique (France)
CISEIN	Consortium for International Earth Science Information Network
CSD	Commission on Sustainable Development
EEZ	Exclusive Economic Zone
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organisation
FIME	Fiji Integrated Marine Ecosystem
FJD	Fiji dollar
FLMMA	Fiji Locally Managed Marine Areas Network
FoS	Foundations of Success
FSPI	Foundation for the Peoples of the South Pacific (international)
GCSDSIDS	Global Conference on the Sustainable Development of Small Island Developing States
GCRMN	Global Coral Reef Monitoring Network
GDP	gross domestic product
GEF	Global Environment Facility
GoF	Government of Fiji
GOOS	Global Oceans Observing System
GTOS	Global Terrestrial Observing System
ha	hectare
IABO	International Association of Biological Oceanography
IAS	Institute of Applied Sciences (USP, Suva)
ICM	integrated coastal management
ICRAN	International Coral Reef Action Network
ICRI	International Coral Reef Initiative
ICRIN	International Coral Reef Information Network
ICRS	International Coral Reef Symposium
IFAD	International Fund for Agricultural Development
IFRECOR	L'Initiative Française sur les Récifs Coralliens (French Initiative for Coral Reefs)

IGO	intergovernmental organisation
IMA	International Marinelife Alliance
IMF	International Monetary Fund
IMR	Institute of Marine Resources (USP, Suva)
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IPB	International Biological Programme
IPCC	Intergovernmental Panel on Climate Change
IRD	Institute de Recherche pour le Développement (France)
ISO	International Organisation for Standardisation
ISRS	International Society for Reef Studies
ITMEMS	International Tropical Marine Ecosystems Management Symposium
IUCN	International Union for Conservation of Nature and Natural Resources (also known as the World Conservation Union)
LMMA	Locally Managed Marine Areas
LRFFT	live reef fish food trade
MAC	Marine Aquarium Council
MAE	Ministre des Affaires Étrangères (Ministry of Foreign Affairs, France)
MEA	multilateral environmental agreement
MFAT	Ministry of Foreign Affairs and Trade (New Zealand)
MPA	marine protected area
MSP	Marine Studies Programme (USP, Suva)
NBSAP	National Biodiversity Strategy and Action Plan (for the Fiji Islands)
NGO	non-governmental organisation
NOAA	National Oceanographic and Atmospheric Administration (US)
NZ	New Zealand
NZAID	New Zealand's International Aid and Development Agency
PAC	Pacific Collection of the USP library, Laucala campus, Suva
PAWORNET	Pacific Women's Information/Communication Network
PCDF	Partners in Community Development Fiji
PIF	Pacific Islands Forum
PIJAC	Pet Industry Joint Advisory Council (US)
PIMRIS	Pacific Islands Marine Resources Information Service (USP, Suva)
PRC	People's Republic of China
PSA	Pacific Science Association
SDL	Soqosoqo Duavata ni Lewenivanua government (Fiji Islands)
SIDS	small island developing state(s)
SOPAC	South Pacific Applied Geoscience Commission
SPC	Secretariat of the Pacific Community; formerly the South Pacific Commission
SPACHEE	South Pacific Action Committee on Human Ecology and Environment
SPREP	(South) Pacific Regional Environment Programme
SVT	Soqosoqo Vakavulewa ni Taukei government (Fiji Islands)
t	tonne
TNC	The Nature Conservancy
UK	United Kingdom
UNCED	United Nations Conference on Environment and Development
UNCLOS	Nations Convention on the Law of the Sea

USCRTF	United States Coral Reef Task Force
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-WCMC	World Conservation Monitoring Centre (formerly just WCMC)
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNF	United Nations Foundation
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC SBSTA	UNFCCC's Subsidiary Body for Scientific and Technological Advice
UNFIP	United Nations Fund for International Partnerships
UNGA	United Nations General Assembly
US(A)	United States (of America)
WCED	World Commission on Environment and Development (also known as the Brundtland Commission)
WCMC	World Conservation Monitoring Centre (now UNEP-WCMC)
WCS	Wildlife Conservation Society
WMO	World Meteorological Organisation
WRI	World Resources Institute
WSSD	World Summit on Sustainable Development
WWF	World Wide Fund for Nature (known in the United States as World Wildlife Fund)
WWF-SP	South Pacific region office of WWF
WWII	World War Two

Part I

Readying the Subject for Study

Chapter One

Aim, Rationale and Argument

CHAPTER LAYOUT

The Study

THE AIM

This thesis investigates environmental policy as an instrument of international governance. Concentrating on one particular environmental subject, coral reefs, it examines how issues arise, how policies are formed, and how people and organisations transfer policy ideas across the world. It also analyses how we—people interested in environmental problems troubling the planet, who follow international attempts to tackle these problems—understand these processes, the conceptual frameworks we use to make sense of them.

We tend to think of international environmental policy as a cooperative moral campaign to save the planet. This thesis challenges that normative orthodoxy. It has a dual aim: (1) to examine how environmental policy arises as an instrument of international governance, opening up space for seeing environmental crises as political assemblies around that notion; and (2) to investigate whether the transfer to developing countries of Western environmental policy ideas may be a form of hegemonic control. This entails more than just ascertaining whether, embedded in policy prescriptions and practices, there are any hegemonic relationships mixing coercion and consent *sensu* Gramsci. The way we think about international environmental policy processes might be contributing to any such hegemony and should also be investigated.

This question over hegemony is the primary question investigated throughout the thesis. The general inquiry into the politics of international environmental policy is a stepping stone, albeit a necessary one, towards this ultimate question.

The extent of hegemony in international policy (the capacity of a dominant group such as a social alliance or geographical bloc to exercise control through the willing acquiescence of those being dominated) has not been systematically investigated across a range of environmental policy issues, although there are some studies of specific issues and organisations (reviewed in Chapter Three). Yet international environmental policy could conceivably entail hegemonic political projects and social alliances; it involves a myriad of people from a diverse range of groups and agencies and is characterised by complex political and social relationships crossing the First World-Third World divide (as characterised by, for instance, Yearley 1996 p. 63-64; Hajer 2003 p. 177-181).

RATIONALE FOR CRITICALLY INTERROGATING ENVIRONMENTAL POLICY

My interest in exploring hegemony in environmental policy compelled me to start researching from a position that privileges not the West but what I understand to be the situation in the geographical 'non-West' of interest to me, the South Pacific. I became interested in the inequities associated with international environmental policy during the time I lived in the Pacific Islands, 1999-2004. Throughout those years I studied development and environmental management, observing the way many Pacific Islanders willingly adopt western terminology, environmental programmes and aspirations without considering their wider political implications. I also noted the influence that expatriate and overseas-trained professionals had on environmental policy advanced in regional Pacific intergovernmental agencies and in international conservation nongovernmental organisations (NGOs) operating there. This spurred my interest in investigating how environmental policy arises as an instrument of governance, the actuality not the generalised descriptions found in many accounts.

I would like to see a more pluralist stance on environmental issues, a greater diversity of perspectives. Too much current debate overlooks difference—different ways of thinking about nature and problems, different economic and cultural systems, and different aspirations held amongst governments, communities and other social groups and political organisations—concentrating instead on issues depicted as international and common to all peoples. I am concerned about the degree to which certain environmental policy stances of western origin masquerade as objective, natural and technocratic truisms (*sensu* Peck and Tickell 2002)—even amongst people whose cultures and histories are very different to New Zealanders and other Westerners. I want to challenge this by demystifying how, in drawing Pacific Islanders into their orthodoxy, common contemporary policy stances on environmental issues are able to have such power. It is not my intention, however, to align myself with particular political interests in the Pacific Islands, nor with any particular constructions of Fijian society (the 'local' selected for study), such as the constructions promoting indigenous Fijian nationalist interests, class or economic interests amongst political élite, or those aiming to promote the interests of rural Fijian communities (constructions and agendas discussed in, for instance, Ravuvu 1991; Ratuva 2000; Robertson 2000; Halapua 2003).

REUBEN JOHN SULU'S CHALLENGE

This masquerade is something that Reuben, a Pacific Islander whose professional work straddles the boundary between the international and the Islands, faces every day. People in this position are important in any study of how 'outside' policy ideas connect with the local. Reuben is important in this research for another reason—his willingness to make known his discomfort when he feels that he or his Pacific Island colleagues are being treated as ill-educated, ignorant or lacking the skills to manage their own lives and countries. In challenging this, he prompts me to try and understand the power of discourses. Reuben also reminds me that people involved in international policy are positioned for better or worse, not always in agreement with the approach they are taking. Although he regularly attends international meetings, this does not mean he is comfortable with the orthodox policy discourse these meetings regurgitate. I got to know Reuben while living in Suva. A Solomon Islander, Reuben studied marine science at University of the South Pacific (USP) in Suva, graduating MSc. Returning home for 18 months, he worked for the World Wide Fund for Nature (WWF) then Solomon Island Fisheries Department before moving to USP's Institute of Marine Resources in Suva, where he helped co-ordinate the Southwest Pacific node of the Global Coral Reef Monitoring Network (GCRMN) between 2002 and 2005. Reuben is aware that this work was not connecting with the reality of people's daily lives in his home village on Ngella and elsewhere in the Pacific Islands. In 2005, he took a job at the USP centre in Honiara, Solomon Islands.

CONVENTIONAL WISDOM TO BE CHALLENGED

In exploring hegemony in international environmental policy, this study seeks to challenge conventional wisdom about this policy field. As Chapter Two discusses, we tend to view international environmental policy as being ideologically neutral and non-political statements, developed and implemented through cooperative, scientifically-based processes. Two key elements of this conventional wisdom must be transcended if this field of policy is ever to be viewed critically: the bias introduced by common understandings of the politics of nature; and the instrumental way in which policy and policy processes are usually viewed. In addition, taking a critical perspective requires moving beyond our conventionally poor understanding of various aspects of international environmental policy processes. It means rectifying the paucity of suitable tools for researching the nature of hegemony in these policy endeavours. In the remainder of the section, I describe these four challenges and outline the strategies I use in this thesis to move beyond them and view international environmental policy critically.

Distorted views of the politics associated with international environmental policy

The interpretation of the politics of nature that dominates our conceptions of international environmental policy has been labelled as 'ecologism' (Vincent 1995). Although ecologism has

political extremes, most of its political positions are intermediate, underpinned by human anthropocentric arguments and sharing common themes: a belief in the systematic interdependence of species and the environment; thinking in terms of the whole ecosystem; a reasonably positive attitude to nature; a tendency to be minimally sceptical about the supreme position of humans on the planet; a general anxiety about what humans, via industrialised civilisation, are doing to the planet; and a questioning of the limits of economic growth in industrialised societies (Vincent 1995 p. 218-219, 221). Groups occupying this middle political ground also subscribe to the belief that the present nation-state and its legal structures, modified to a greater or lesser degree by environmental consciousness, are adequate, indeed necessary, for meeting the requirements of environmental ideology (Vincent 1995 p. 225).

The tendency to interpret the politics of the contemporary field of international environmental policy as ecologism introduces certain biases into the study of these politics and of the power relationships associated with these policy processes. For example, it is not necessarily coincidental that the appearance, over the past four decades, of political ecologism has paralleled growing international cooperation in economic and political domains, and the internationalisation of environmental governance, despite interpretations to that effect (such as Berkhout *et al.* 2003 p. 3). The practical politics of ecologism are rooted in liberal institutionalist values of cooperation and knowledge sharing; liberal institutionalism views international regimes as benevolent, voluntary and cooperative and regards global governance as the solution to global problems such as environmental degradation and development (Litfin 1994 p. 190; Ford 2003 p. 120). Ecologism is thus a distorted lens through which to view the politics associated with the field of international environmental policy.

Much of the character of these politics remains hidden because of the depth to which views of international environmentalism are normative. Prominent contemporary paradigms—global environmentalism, sustainable development, global environmental change, environmental managerialism, and biodiversity conservation—tell us that not only that environmentalism is a global-level phenomenon but that it *should* be so. The way that science is regarded as an appropriate way of identifying environmental problems is also normative, and along with the idea that international cooperation and the transfer of knowledge and expertise from developed to less developed countries are appropriate responses to those problems. Normative theories do not, however, explain how international efforts are made to seem locally relevant, or how various local efforts become internationally relevant. Instead, they become enmeshed in the charismatic attraction of the global. Tsing (2000 p. 330) points out how it is too easy to assume that globalist projects and dreams remake the world just as they want it. As a result, we may fail to recognise how the metaphors and other discursive devices legitimising globalism can serve certain political programmes and how, in doing so, they may hide contradictions, ambiguities and complexities of socio-political reality. Moreover, as Escobar (1995), Jasanoff (1996), Yearley (1996), and Goldman (2004) have all pointed out, we may overlook inequalities such as the distribution of power, costs, profits and responsibilities. We may overlook how information about the state (health) of nature in various parts of the world is a representation, possibly even an ideology that supports relations of domination on an international scale. We may even neglect to observe shifts in the claims being made and in coalitions formed.

Instrumental understandings of policy

Conventional understanding of international environmental policy is derived from two models of policy: the rational problem-solving model—with its normative view of how to approach problems—plus a political model of governance associated with territory and based upon the notion of hierarchical tiers operating cooperatively with interested NGOs. In the latter model, successive tiers of political governance and jurisdiction, from the supra-national or intergovernmental organisation, through the national, state or region, community, down to the household, conduct policy making and planning as a hierarchical process. Policies set at international level are subsequently brought to national agendas as general principles; from there, they reach sub-national and local level as more detailed and concrete actions (Peuhkuri and Jokinen 1999 p. 142). According to this model, the different layers of rules are commonly regarded as hierarchical in legitimacy and authority; failures for higher level rules to be followed at lower levels are usually ascribed to a lack of enforcement, rather than to belief in any alternative conceptualisation of political authority.

This instrumentalism extends to the definition of policy, which Titmus (quoted in Shore and Wright 1997 p. 5) defined as the principles that govern action directed towards given ends. Yet policy is highly political. In shaping, guiding, managing and regulating peoples' conduct, policy is, to use Foucault's expression, an instrument in the conduct of conduct (Foucault 1991; Dean 1996 p. 47). Policy conveys the aspirations those in authority have about how they want society to be—whether at local, national or international scale—and how they want people to be governed. In this, policy usually serves social as well as political functions—addressing conflicting aspirations and views, ruling out disagreements, enabling compromise, promoting cooperation among different groups of people. Yet, in the social function of planning the future, policy contributes to instrumental rationality in the activities of groups of people by promoting concepts such as efficiency and effectiveness.

Poor understanding of international environmental policy

Although it can be difficult to escape this instrumentalism, there have been some critical studies of international environmental policy (for example, the World Bank's crusade of neoliberal environmentalism (Goldman 2001; 2004), and various critiques of international conservation (such as Brosius 2004)). But, in general, environmental policy is treated as if it were politically and ideologically neutral, and a reflexive attitude is little valued (Broadhead 2002 p. 5). The extent to which contemporary ideas about appropriate environmental management are codifying and transferring social values and norms across that space, although recognised, are only beginning to be investigated systematically (e.g. Marcussen 2003; Brosius forthcoming). Furthermore, the various modes of power exercised through international environmental policy processes connecting with developing countries are generally unclear.

A review of conventional and critical understandings of international environmental policy (in Chapters Two and Three respectively) reveals a limited understanding of several other aspects of those processes. These include: (1) how the environment is constructed as an international problem requiring intervention on an international level to solve, how various locales are discursively drawn into the global problem specifications, and how this construction leads to certain policy responses; (2) the

various actors involved, their interests, and how and why they cooperate, including (3) the contestation occurring, and modes of power being exercised, under an outwardly cooperative framework; and (4) the socio-political role that science and scientists play.

A paucity of tools for researching the nature of hegemony

There are few analytical tools available for investigating hegemony in international environmental policy. Hegemony is usually understood as a deliberate strategy for winning and maintaining power, requiring leadership and direction. This may be achieved not simply by coercion or by direct imposition of ruling ideas but by subtle manipulation, in such a way that "the power of the dominant groups appears both legitimate and natural" (Hebdige 1993 p. 366). Italian Marxist Antonio Gramsci, with whom the concept is nearly always linked, identified a situation in which a dominant power gains consent to its ideology through everyday norms and institutions, exercising control in a way not always readily visible. This is domination as the exercise of power in a mode whereby individuals voluntarily acquiesce but do not experience that power as conflicting with their interests.

There are, however, different ways of reading hegemony in international policy, some seeing it as good and some as bad, as Chapter Four explores. Some analyses (particularly those assuming the nation-state to be a territorial container of hegemonic struggle) stress hegemony as consensual power, others (especially global-scaled approaches based on world systems theory) stress it as coercive power (Sparke 2004 p. 779). Thus the theoretical and normative threads of hegemony need to be unravelled before it can be used as a critical tool for analysing policy.

Furthermore, maintaining hegemony is not necessarily a deliberate strategy. Hegemony may occur through the reproduction of orthodox discourse, of everyday commonsense for instance, or of expert discourses found in various fields of academic and research endeavours (Ford 2003 p. 121-122). This opens up a suite of questions about the relationship between human intentionality and social order. Is there an intention, in hegemonic practices related to international environmental policy, to maintain the existing social order, for example?

In contemporary political and social analyses, identifying an intention to dominate is difficult without employing psychological analyses. As Camric (1986 p. 1040) has pointed out, modern sociology does not address this matter at all well; in so far as claims are made about human conduct, what prevails in modern sociology is a model of action that has variously been called purposive, rational, voluntaristic, or decisional. This is akin to the concept of the rational actor that dominates contemporary political science and economics.

> According to this widely used model, action is a process arising from various utilitarian, moral, affectual, or other motives—motives formed of calculation, belief, attitude, and sentiment—that define ends that an actor then intentionally pursues by choosing, from among available alternatives, the means that appear most appropriate when judged by norms of efficiency, duty, familiarity, and so on (Camric 1986 p. 1040).

This lack of suitable tools for investigating hegemony in international policy situations poses another challenge for a critical interrogation of environmental policy. Before using hegemony as an

investigative tool, one must first develop a theoretical and analytical framework (which Chapter Four does).

STRATEGIES FOR TRANSCENDING CONVENTIONAL WISDOM

The key to transcending conventional wisdom about international environmental policy is to employ a broad concept of politics, one looking beyond an instrumental view of nature as resources to be used to support human life and further human interests. Carter (2004 p. 187) advocates such a view, recognising how the interdependence of natural and social phenomena shape political activity. So too does Bruno Latour (2004 p. 4), who argues that in modern society, nature becomes knowable through the intermediaries of science and politics, how, when thus known, it is represented in policy, also how that representation is a political act. Latour (2004 p. 244) suggests that since the idea of nature and of politics both depend upon a certain conception of science, a critical rethinking must tackle all three ideas; only then can that which has been externalised (i.e. politics) be taken into account again. Latour calls this exercise of rendering the political visible 'ecological critique'.

As well as a broad conception of politics, I also take a broadly inclusive approach to the study of policy, encompassing 'policy-talk' and 'policy practice', with a particular emphasis on the way policy is being conceptualised and conceived, framed and advocated (Gasper and Apthorpe 1996 p. 6). I characterise policy connections across national boundaries as 'endeavours', 'ventures' or 'processes' that are part of the 'arena' of 'international policy'. That terminology fails, however, to reflect how international environmental policy is created in places which are themselves local (discussed further in Chapter Four). This is an example of the many semantic problems I encountered throughout the study, current terminology sometimes proving inadequate for designing the research and constructing a theoretical argument. In Chapter Four, I explain my strategy for dealing with other problematic terms.

In taking this broad conception of policy, I concentrate on the realm of public policy. There is some debate about what is public policy, compared to non-public or private policy (Parsons 1995 p. 8-9). Rather than attempting to define this, I take an inclusive approach. I regard all international policy processes, whether they involve governmental, intergovernmental or non-governmental organisations, as public and within the scope of this study, and any links between these organisations and local ones on matters of policy as public policy concerns.

Another strategy I use is to divorce this study from the modernist conception that the purpose of acquiring knowledge is to "influence for the better the human condition"—to assist in the pursuit of the improvement in human lives and progress of humankind implied by modernity (Jones 1993 p. 21). This removes any sense of teleology, including the idea that environmental management efforts are being shaped by an overall purpose such as saving the planet; it allows me to explore different strategies and occurrences in policy transfer, including the extent to which they are intentional. I am able to do this because the knowledge gained from this study is not intended to be part of the ongoing project of improving environmental management. It is, instead, a step removed, intended to create new consciousness about international environmental governance and policy. I have based the study upon a Nietzschean perspective of knowledge (knowledge being the sets of ideas that a social group or society

of people accept as real). Nietzsche saw knowledge as political, the historically contingent product of linguistic and social practices of particular communities of interpreters. In this view, power and knowledge cannot be separated, knowledge being an assemblage of drives and interests reflecting the interests of its knowers (Edgar and Sedgwick 1999). This view underlies Foucault's work (and is also found in Marxism), and opens the door to inquire into the knowledge encountered in environmental policy processes in a Foucauldian manner—into the social, historical and political conditions under which statements come to count as true or false. In the Foucauldian perspective, truth in environmental policy matters is not confined to being the product of science and scientific methods, as commonly regarded in contemporary western society. The conditions under which supposed scientific truths are produced therefore become a matter for inquiry, as does the political employment of knowledge and ideas as resources in policy processes.

Yet no single discipline offers a suitable analytical framework for a critical study of international environmental policy addressing policy practices, political motivations, the exercise of power and its interface with knowledge and discourse. Furthermore, as I discussed earlier in relation to liberal institutionalism, discourses from various disciplines have helped shape how we understand the contemporary reality of international environmental policy matters. In seeking to understand these disciplines' influence and discursive power (and thus their contribution to hegemony), I therefore use a trans-disciplinary approach. I canvas theoretical perspectives and research from various disciplines, exploring geography (geographies of critical policy, globalisation and relational power), political science, international relations, political ecology, development studies, sociology, anthropology, and science and technology studies. Additionally, I interrogate geo-bio-physical descriptions of reefs employed in policy processes. As a result, it is difficult to characterise this research as belonging to any particular branch of investigative endeavour in the social sciences. Rather, it employs a disciplined 'multiperspectival' eclecticism as Layder (1994 p. 222) recommends.

To a Nietzschean perspective of knowledge, a post-structuralist view of discourse, and Latour's (1993; 2004) modern ecological critique, I add social constructionist understandings of science as an endeavour shaped by the social, political and historical conditions under which it occurs plus an anthropological line of enquiry. The latter is influenced by Latour's observations on modernity and science, by anthropology of science and technology of a radical bent (as advocated by Hess (1997)), and by global ethnography's notion of modes of cultural interconnection that tie people in far-flung places or travel with them across the world *sensu* Gille and O Riain (2002 p. 287). Chapter Four explains this disciplined eclecticism further.

Levels of inquiry

I inquire critically into policy at three different levels, summarised in Table 1. The first level examines the international connections, flows of information, policy ideas and funding that constitute the reality of international coral reef policy processes. This is similar to Shore and Wright's (1997 p. 14-16) concept of policy as webs and relations between actors and discourses across space and time. It is also akin to a geographical study of globalisation—of contemporary environmental governance crossing national boundaries in a globalised world (Robertson 1992 p. 7). This type of inquiry entails analysing

various ways in which coral reefs have featured in international policy, the issues associated with them—climate change, rising sea-level, overfishing, physical destruction, and pollution—and the groups of people seeking to address those issues.

TABLE 1: THE THREE LEVELS OF INQUIRY

1	Connections between international coral reef policy endeavours and those in the Fiji Islands: relations between actors, funding flows, discourses that connect people across space and time
2	Critical analysis of these connections, analysing their political nature, the modes of power being exercised, and the way agency and discourse intersect
3	Reflexive epistemological and sociological inquiry into how contemporary intellectual frameworks of inquiry and epistemic practices produce certain views of the world and colour our understandings of how environmental policy arises

This study of connections is a necessary prelude to the second level critically examining these policy processes. This uses contemporary social science perspectives that treat policy not as the politically or ideological neutral subject of policy analysis but as a technology of power and expression of social relationships. I examine normative claims that define a problem in a particular way while closing off other ways of thinking. While locating accounts of the biophysical nature of coral reefs in policy, I question the way those depictions have been constructed, the metaphors they employ, the values embedded in these, and the way these are used in policy processes. Moreover, I examine the mobilising metaphors and narratives that cloak policy with the symbols and trappings of political legitimacy.

To undertake this analysis, I need to adopt particular frameworks of inquiry, which is where a third level of inquiry is needed. In the course of examining global-local links in international coral reef policy, I also critique the dominant frameworks of inquiry and epistemic practices that provide a starting point for this study. Both anthropology and postmodernism suggest that in order to study the links between policy, subjectivity and governance, to interrogate the supposed natural or axiomatic 'order of things', it is necessary to detach and reposition oneself sufficiently far from the norms and categories of thought that give security and meaning to the moral universe of one's society (Shore and Wright 1997 p. 8). This level of inquiry also involves recognising the normative theory approach of much policy literature (whether found in policy science, economics, political science, sociology, international relations or development theory), and taking a skeptical approach to it—looking for the political basis of theories, arguments, and narratives and for the way those may benefit entrenched interests. This is the basis of a further strategy—the interweaving of empirical investigation with reflexive critique throughout the thesis.

In this highly reflexive critique, I first uncover and denaturalise the subject to make it ready for study. This entails unravelling the multiple threads that collectively constitute our orthodox understanding of international environmental policy, examining their historical influences (Chapter Two), identifying the extent of problems in conventional understandings and designing a set of questions to guide the

empirical study (Chapter Three); and building a theoretical and methodological base from which to proceed (Chapter Four). Only then do I analyse the research subject, international coral reef policy endeavours.

METHODOLOGIES

A series of text boxes, similar to this one, is interspersed throughout the chapters (and listed in the Contents). These explain the different approaches used to investigate topics; anyone wanting to know my entire research methodology should read these in sequence.

Rationale for the Focus on Coral Reef Policy

I selected coral reefs as suitable natural phenomena on which to focus this study of environmental policy for several reasons, not least of which was the widespread belief amongst the community of reef scientists and managers that reefs are under severe threat globally, in a state of crisis. Several authoritative scientific publications have emphasised the inescapability of the crisis, including papers in two widely-read weekly science journals *Science* and *Nature*. Popular articles direly spelling out the damage to reefs inflicted by humans have become common (e.g. Chadwick 1999; Tickell 1999; Denecke 2001; James 2001; Hodgson and Liebeler 2002). This concern, detailed in Chapter Five, is two-fold. There is apprehension about global environmental change, based upon a hypothesised connection between greenhouse gas emissions, enhanced global warming and recent widespread coral bleaching. Reefs are also believed to be suffering large-scale anthropogenic degradation as a routine consequence of modernity.

Predictions about the future of coral reefs are ominous. Reporting to the Parties to the Convention on Biological Diversity (CBD) in 2000, the Executive Secretary of that convention's secretariat observed that:

> The latest global predictions suggest that a further 14 percent of the world's coral reefs will be lost by 2010, and another 18 percent in the 20 years following, without reductions in the current human-induced stresses on reef ecosystems from growing coastal populations and economies. This means that 59 percent of the world's reefs are under immediate loss within several decades (Executive Secretary, Convention on Biological Diversity 2000b p. 13).

In 2001 the *Economist* reported some scientists fear global warming will bleach most of the world's coral reefs to barren skeletons within 50 years (Economist.com Global Agenda 2001). They may even cease to exist in a few centuries, according to some. Thomas Goreau, president of the Global Coral Reef Alliance has warned that the world's coral reefs are well on the way to being the first ecosystem to undergo mass extinction caused by global warming (Global Coral Reef Alliance™ 2002).

Greenpeace Australia has claimed that if current rates of climate change continue then the world's coral reefs might be wiped out in 100 years (Union of International Associations 2000).

Several international policy initiatives focus on coral reefs, a key one being the International Coral Reef Initiative (ICRI), which promotes sustainable use and conservation of reef resources. Formed in 1994, ICRI brings representatives from developing countries together with major donor countries, development banks, intergovernmental organisations, scientific associations, and NGOs (Drake 1996; Mieremet 1996; Dight and Scherl 1997). International NGOs lead other international coral reef protection initiatives. (Chapter Seven analyses these various initiatives).

Coral reef policy is influenced by key contemporary environmental paradigms. Thus, studying international coral reef policy processes provides an opportunity to interrogate the socio-political construction of these paradigms, global environmental change included. Global environmental change is not just a bio-geo-chemical process; it is also a social process and a policy issue, and is stimulating questions about how the world's socioeconomic system can sustain its development without compromising irreversibly the geospheric and biospheric conditions necessary to the survival of the human species (Prades 1999 p. 13, and as discussed in Chapter 12 of Moore *et al.* 1996, for example).

As a natural phenomenon of much contemporary interest and value, coral reefs are an interesting focus for a study of international environmental policy. In many countries, reefs provide not only the protein and nourishment that coastal populations need to survive, but also income through fisheries and tourism. They provide building blocks of land, extreme examples being atolls in the Pacific and Indian Oceans built solely by coral reefs (Done *et al.* 1996 p. 397). Coral reefs provide natural protection against hurricanes, wave damage, and erosion; they protect embayments historically important in the development of human transportation and commerce (Reaka-Kudla 1997 p. 84; Cesar 2000 p. 14-15). Bioerosion of carbonate reef framework and the calcareous shells of reef organisms provide almost all the sand on tropical beaches, popular with tourists and holidaymakers (Reaka-Kudla 1997 p. 84). Coral reefs are also valued for their biodiversity. Habitat for thousands of species, they are often called "the rainforests of the sea" (Adey *et al.* 2000). In addition, coral reef plants, animals, and microbes are rich in unusual organic compounds, including antitumour compounds, whose medical and pharmaceutical potential is just starting to be defined (Done *et al.* 1996 p. 397; Reaka-Kudla 1997 p. 84).

Despite their interest to humankind, coral reefs have received little academic attention from social scientists. In the journal *Coral Reefs,* founded in 1982, virtually all the papers have originated from natural and physical science; furthermore, none of the journal's editors are social scientists. Yet, for a social science researcher, coral reefs are a readily identifiable unit on which to work (as are forests and urban environments for instance). Moreover, since coral reefs occur largely in developing regions, a study of international coral reef policy reflects First World-Third World issues, perspectives and tensions. It facilitates a study of hegemonic control across that divide. A focus on coral reefs also enables me to study environmental policy in a region closely linked to New Zealand—about forty percent of the planet's coral reefs are in the Pacific Ocean (Table 2).

1,290 square kilometres of coral reefs are in New Zealand's freely associated states (Cook Islands and Niue) and another 50 square kilometres around Tokelau (Spalding *et al.* 2001)—see Table 3, also map

1. Although the New Zealand Government takes a substantial interest in Pacific Islands' environmental policy, it has accorded little attention to coral reefs (various interviews, New Zealand Ministry of Foreign Affairs and Trade (MFAT) June 2003). One of the secondary benefits of this research will be to make information about these policy initiatives more accessible to New Zealand government policymakers.

TABLE 2: ESTIMATES OF CORAL REEF AREA WORLDWIDE

Region	Area of coral reef (km^2)	% of world total
Indo-Pacific	**261,200**	**91.8**
Pacific	115,900	40.8
Southeast Asia	91,700	32.2
Indian Ocean	32,000	11.2
Red Sea and Gulf of Aden	17,400	6.1
Arabian Gulf and Arabian Sea	4,200	1.5
Eastern Pacific	**1,600**	**0.6**
Atlantic and Caribbean	**21,600**	**7.6**
Caribbean	20,000	7.0
Atlantic	1,600	0.6
TOTAL	**284,300**	

Source: Spalding *et al.* (2001 p. 17)

ACCURACY IN CALCULATIONS OF THE AREA OF CORAL REEFS

The source of statistics in Tables 2 and 3, the *World Atlas of Coral Reefs*, contains up-to-date calculations of coral reef area. There are, however, no estimates of accuracy included: "true error terms cannot be calculated" (Spalding *et al.* 2001 p. 402). The area of Pacific reefs is likely to be overstated in Table 1, and that of Indian Ocean reefs correspondingly understated. In their regional calculations, the authors included reefs around the west and north of the Australian mainland in the Pacific figures (Mark Spalding, World Conservation Monitoring Centre (WCMC), principal author of the atlas, *pers. comm.* October 2003). Although I asked Spalding (by email) for a breakdown of the Australian reef areas by location, he merely suggested that "probably 70-80 percent" were in the Pacific Ocean. This illustrates how statistics about coral reefs are often less accurate than they appear, a recurring theme in this study.

PACIFIC OCEAN

MERCATOR PROJECTION

NOTE: SCALE INCREASES TOWARDS THE POLAR REGIONS

KILOMETRES
0 200 400 600 800 1000
50° 40° 30° 20° 10° 0°

EQUATORIAL SCALE 1 : 24 000 000

OCEAN DEPTHS IN METRES
0 200 2000 4000 6000

International Airport
National Boundary
Other Boundary

STANDARD TIME ZONES
9:00 10:00 11:00 AM MD (Sat.) 12:00 MD (Fri.) 1:00 2:00 3:00 PM
130° 135° 140° 145° 150° 155° 160° 165° 170° 175°E 180° 175°W 170° 165° 160° 155° 150° 145° 140° 135° 130° 125°
25° 20° 15° 10° 5° 0° 5° 10° 15° 20° 25° 30° 35°

NORTH PACIFIC OCEAN
SOUTH PACIFIC OCEAN
HAWAIIAN ISLANDS
MARSHALL ISLANDS
CAROLINE ISLANDS
FEDERATED STATES OF MICRONESIA
PALAU
PALAU ISLANDS
COMMONWEALTH of the NORTHERN MARIANAS
GILBERT ISLANDS
REPUBLIC OF KIRIBATI
NAURU
PHOENIX ISLANDS
TOKELAU ISLANDS
TUVALU
ELLICE ISLANDS
SOLOMON ISLANDS
NEW GUINEA
PAPUA NEW GUINEA
VANUATU
NEW CALEDONIA
FIJI ISLANDS
SAMOA
AMERICAN SAMOA
COOK ISLANDS
TONGA
NIUE
SOCIETY ISLANDS
FRENCH POLYNESIA
TUAMOTU ARCHIPELAGO
MARQUESAS ISLANDS
TUBUAI ISLANDS
LINE ISLANDS
PITCAIRN ISLANDS
GAMBIER IS
NEW ZEALAND
NORTH ISLAND
NORTHERN TERRITORY
QUEENSLAND
CORAL SEA ISLAND TERRITORIES
Arafura Sea
Coral Sea
Torres Strait
Gulf of Carpentaria
Great Barrier Reef
Challenger Deep
Marianas Trench
Ryukyu Trench
Ramapo Trench
Japan Trench
Kermadec Trench
Tonga Trench
Hikurangi Trench
Macquarie Ridge
Emperor Seamounts
Hawaiian Ridge
Line Islands
Tuamotu Archipelago
Society Islands
Austral Islands
Cook Islands
Tasman Sea
Solomon Sea
Banda Sea
Ceram Sea
Timor Sea
Great Australian Bight
Lake Eyre
Lake Mackay
Great Sandy Desert
Great Victoria Desert
Simpson Desert
Gibson Desert
Tanami Desert
Great Artesian Basin
Great Dividing Range
Murray River
Darling River
Murrumbidgee River
Lake Eyre Basin
Great Barrier Reef
Coral Sea

TABLE 3: AREA OF CORAL REEF IN THE PACIFIC OCEAN BY ISLAND GROUP

Island group	Reef area (km^2)	Political status
Australia (including some in the Indian Ocean)	48 960	Independent nation-state
Papua New Guinea	13 840	Independent nation-state
Fiji Islands	**10 020**	**Independent nation-state**
Marshall Islands	6 110	Freely associated state (USA)
French Polynesia	6 000	Dependent territory (France)
New Caledonia	5 980	Dependent territory (France)
Solomon Islands	5 750	Independent nation-state
Federated States of Micronesia	4 340	Freely associated state (USA)
Vanuatu	4 110	Independent nation-state
Kiribati	2 940	Independent nation-state
Tonga	1 500	Independent nation-state
Hawai'i	1 180	State of the USA
Palau	1 150	Freely associated state (USA)
Cook Islands	1 120	Freely associated state (NZ)
Wallis and Futuna	940	Dependent territory (France)
Tuvalu	710	Independent nation-state
Samoa	490	Independent nation-state
American Samoa	220	Dependent territory (USA)
Guam	220	Dependent territory (USA)
Johnston Island	220	US territory (uninhabited)
Niue	170	Freely associated state (NZ)
Pitcairn Islands	<100	Dependent territory (UK)
Nauru	<50	Independent nation-state
Northern Marianas	<50	Commonwealth of the USA
Tokelau	<50	Dependent territory (NZ)

Source: Chappell (1999); Spalding *et al.* (2001)

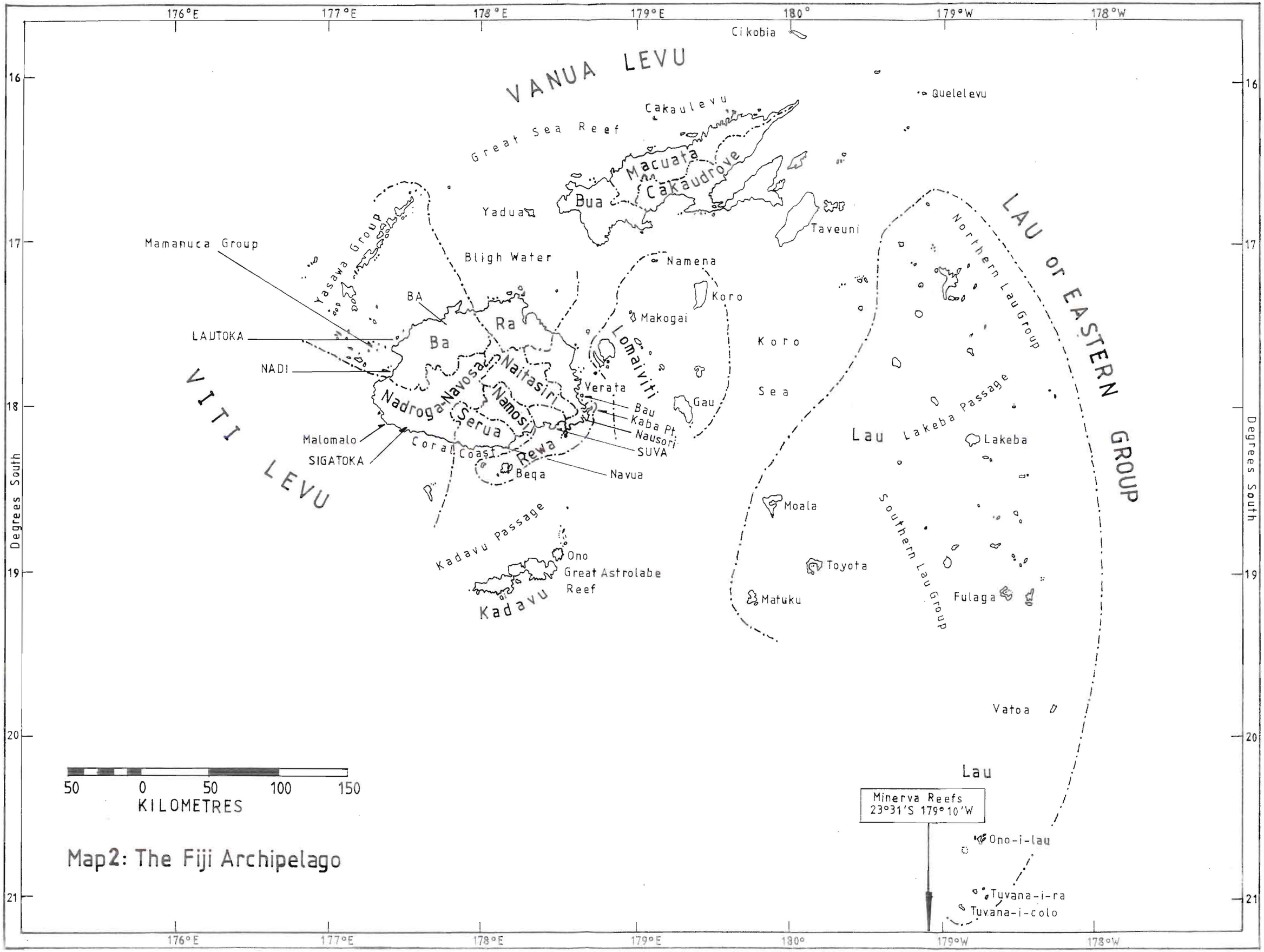
A focus on the Fiji Islands

While a focus on coral reefs provides a suitable topic for investigating international policy concerned with environmental crises, a focus on how Fiji, as a small island developing state, is connecting to the international through policy endeavours permits an investigation of hegemony in those matters. I first investigate how international coral reef policy arises in sites outside the Fiji Islands (covered in Part II, Chapters Five to Eight), then explore the multiple policy connections that people in the Fiji Islands concerned with reef policy have with people in other parts of the world (Part III). In other words, I examine the nature of contemporary connections between the Fiji Islands and international policy

endeavours (partly in Chapter Eight but principally Chapters Nine to Thirteen). This reveals the messy nature of reality.

The territory of the Fiji Islands consists of an archipelago, centrally located in the Pacific Ocean with some outlying reefs to the south and east, plus Rotuma a small group of outlying islands 5000 km north (for pragmatic reasons the latter plays little part in this study). The archipelago, shown on Map 2, lies between 15°S and 23.5°S (Minerva Reef), and 176°E (Conway Reef, shown on Map 3) and 178°W. The archipelago contains hundreds of islands, islets and cays, over 110 of which are inhabited. The country's population, estimated at 830,000, is the third largest of all Pacific island groups (excluding Australasia), after Hawai'i and Papua New Guinea (Lal and Fortune 2000 p. 566-567).

The archipelago has extensive coral reefs: 10,020 square kilometres of reef surround 18,272 square kilometres of land (Table 3). As well as being the most complex coral reef system in the world, this is also one of the largest (Andréfouet 2004). In the region, only Australia and Papua New Guinea have larger systems.



Map2: The Fiji Archipelago

The Central Argument: Summary

Running through this thesis is a theoretical argument about the way in which a Foucauldian knowledge system, which I call the 'global environmental policy discourse', enables and constrains contemporary environmental policy. This argument is situated within a wider one about how the diffusion of environmental policy through science/policy/conservation networks is further integrating the world. These networks operate within and around formal state organisation at national and international level, forging connections with what is often taken to be 'civil society', creating global truths and translating them into global policy. They represent a political assembly around the notion of global environmental crisis (political in the broad sense discussed earlier).

I argue that this deepening integration of humankind represents a new era of human history, one in which ecology has become not only an ideological statement about how the world is meant to be, but also a model for Third World development. As a strategy for humankind's future, development is no longer necessarily progressive and unidirectional, it is ecological and adaptive under the guiding hand of ecological technocrats. I show how these experts are actively drawing the Pacific—itself blending traditional, community-based society and post-colonial national society—into a global ecological society, a phenomenon I call 'developmental environmentalism'. In this, the West continues to dominate the Third World. Environmental policy networks that draw the Third World into western imaginings of the environmental crisis are premised on the notion of western superiority in institutions, governance systems, technical skills and policy prescriptions. Their politics aim to maintain the existing political order between the blocs of industrialised and non-industrialised countries.

I start to build this argument about the deepening, hegemonic integration of the world by describing the nature and origins of the global environmental policy discourse, including its close relationship with modernisation theory (in Chapter Two). I show how this discourse is shaped by the same legacy of Enlightenment thought that has resulted in development being labelled as technocentric: faith in rational planning and in science's ability to identify and solve environmental problems, and a belief in the West's technical and intellectual superiority. Although of western origin, this discourse masquerades as universal, enrolling nature, and those concerned about it, around the globe.

The particular political contexts from which this discourse's supposedly universal norms and values have arisen are disguised in technocratic language and generalisations. So too is the political agenda it justifies and the political manoeuvrings it legitimises. This is the 'orthodox' version of the discourse, a counter-reading of which is required to expose its politics. It is difficult to step outside this orthodox version and see its political content. The concept of the environment as a problem and policy as the solution to that problem pervades both mainstream and critical environmental thought to such an extent that it is difficult to perceive the environment and policy in other ways. Stepping outside orthodoxy requires the sort of 'multiperspectival' analysis described earlier, in order to analyse policy situations—the modes of power being exercised, interests, technical practices of experts, and the appeals to the universal that enrol people and places around the globe. It requires reflexive analysis, developing theoretical arguments and testing whether they shed light on the situations being analysed.

In such an analysis, I show how the outwardly cooperative framework of global environmental issues disguises the modes of power used to enrol local sites such as the Fiji Islands. It disguises how Island 'experts' co-opt the narratives, storylines and metaphors characterising policy texts for the same purposes as those who create these situations for international, expert intervention: to maintain their own legitimacy, to pursue professional opportunities, and to maintain certainty and order in their world. The asymmetrical relationship between developed and developing countries, which international environmental policy establishes and maintains, persists despite such co-optation. It is, however, a relationship predicated on more than a belief in western superiority and a blindness to local policy approaches that deviate from western models—it is biased towards seeing developing counties as the cause of global environmental degradation. Furthermore, developing countries are so overcrowded with western policy solutions, there is little time and space for them to develop local policy approaches and technologies.

In revealing international coral reef policy as political, bringing back into account what has been externalised from modern accounts of environmental policy. I am also critiquing and undermining modernisation theory and its status as a meta-narrative. Modernist doctrine, along with the phenomenon of universalised expertise in environmental policy—a broad range of experts who speak for a universalised nature as a result of science's shift into environmental policy—is coalescing in hegemonic policy. This belies the assumption of universal benevolence embedded in modernisation theory's concept of development, through which environmental policy prescriptions are being promoted in Third World countries such as the small island states of the Pacific. Moreover, it raises doubt about the ability of international efforts to address, through scientific reason, instrumental rationality and international cooperation the challenges posed by widespread environmental degradation. This doubt arises partly because both modernisation and globalism see international development as an inevitable rather than chosen process; they are thus teleological (Marcuse 2004 p. 816, footnote 4, discusses globalism's teleology). (Teleology, according to the Concise Oxford Dictionary of Current English Sixth Edition 1976, is a view that developments are due to the purpose or design that is served by them.) Modernisation has a teleological rationality that configures particular contexts as cases within a unilinear, evaluative scale of modern-ness and development. Doubt also arises because of the simplistic caricatures of the complex social world of those using and governing reefs in developing countries. This reflects the blindness of this theory's metaphor of the modernisation process: as long as there is a strategy for the modernisation of countries not yet in that position, there is little need to understand their societies' intricacies since addressing simplistic lists of failures and shortfalls will suffice to propel them up the slope to modernisation.

Casting doubt upon the optimism of modernisation underlying international environmental policy discourse and revealing this asymmetry between developed and developing countries, this thesis demystifies how, by drawing Islanders into their orthodoxy, common contemporary policy stances on environmental issues are so powerful: they disguise politics and hegemony as technical programmes and build on the promise and allure of development. In revealing this, the thesis begins to open up space for political interventions so that in future, alternatives may be envisaged.

Chapter Two

The Orthodoxy of International Environmental Policy

Introduction

This chapter describes the knowledge/power system within which contemporary international environmental policy operates. In the main body of the chapter I follow a Foucauldian-style exercise, treating the discourse of global environmental policy as a "monument to be described in its character-disposition" (McHoul and Grace 1998 p. 49). I first describe how the discourse is based upon a sense of global consciousness of nature and of looming environmental crisis, and how that crisis is seen as a problem arising out of the ordinary practices of modernity. I then describe the standard solutions that characterise this policy discourse. From there, I sketch out how, through discourse, developing countries are being drawn into both the global problematic and policy solutions. Finally, I examine the discourse's conditions of existence, the political operations that permitted its formation. This establishes its relationship to modernisation theory. It also allows me to examine, in later chapters, the operations exercised by different discoursing subjects.

The Character of the Discourse

NATURE AS AN GLOBAL ENVIRONMENTAL PROBLEM

Global environmental consciousness and a sense of crisis

Underlying contemporary international environmental policy is both a looming sense of crisis and a growing global environmental consciousness. Since the 1960s, there has been a resurgence of concern about all things 'green', which has become increasingly global in outlook (Bayliss-Smith and Owens 1994 p. 122). Local problems have become global ones, threatening to affect the human race on a scale we have not previously experienced, and demanding action. This sense of global environmental consciousness is captured in metaphors that reflect shared vulnerability to, and responsibility for, global insecurities, such as 'our common future', 'the common heritage of mankind' and the idea that

the international community should, on behalf of nature in different parts of the planet, act as 'global citizens' (Bonnett 2003).

The paradigms that occupy the centre ground of contemporary international environmental debates—sustainable development, global environmental change and conservation—are underpinned by the notion that global environmental problems are in some way solvable through globally-co-ordinated action. Similarly, 'global' narratives about significant environmental problems such as deforestation, desertification, loss of biodiversity, and climate change not only depict these as problems of global scale, they suggest the necessity for global-scale solutions and international cooperation (Adger *et al.* 2001 p. 684). In 1987 the World Commission on Environment and Development (WCED) (also known as the Brundtland Commission) argued that environmental problems had become so great, the global community must join forces in a common strategy for growth and development based upon sustainability. The environment has thus become a problem for humankind, one that can only be solved through certain measures and through one big united effort; a global community is thus being forged on the basis of a new and more powerful kind of interdependence than was previously the case (Hajer 1995; Bonnett 2003 p. 558). This, in brief, is the orthodox version of the discourse of global environmental policy, a version that presents an apolitical face yet reflects the politics of ecologism described in Chapter One.

Modern science is implicated in this emerging global environmental consciousness and sense of looming crisis. Science's ability to elucidate facts about the functioning of the natural world, to detect global environmental change phenomena such as climate change and to predict future changes, has given it a central role (e.g. Taylor and Buttel 1992 p. 405; Jasanoff 1996). Scientific investigation, assessment and monitoring using improved technology—instrumentation, computerisation (particularly number crunching), and improved mobility, whether scuba or satellites—have facilitated global-scale scientific predications. Science has let us recognise how humans may be pushing the limits of the biosphere's functions; that recognition is credited with speeding up the process of transnational cooperation reflected in the proliferation of environmental agreements since the 1960s (Jasanoff 1996 p. 174). Moreover, science has allowed policy makers, lobbyists and intellectuals to speak universally about the planet's environmental problems, analysing these in objective and authoritative ways that transcend national differences and political interests (Shackley and Wynne 1995; Yearley 1996 p. 100). The formation of international organisations has also played a role. For example, Miller (2001b) describes how the creation of the World Meteorological Organisation (WMO) and its worldwide climate observation network, allowed scientists to investigate the atmosphere as a global system and thus to see it as a global commons.

The media has also played a role in disseminating and reinforcing belief in a looming global environmental crisis, keeping stories such as global warming in constant circulation. Through the media, particularly images on television and in newspapers, environmental problems in developing countries have entered into popular consciousness in developed countries (Bayliss-Smith and Owens 1994 p. 122). Moreover, media coverage of environmental issues, along with official publications from governments and the United Nations, NGO advertising campaigns, and the logos of environmental

groups, repeatedly draw public attention to images of an imperilled global environment (Yearley 1996 p. viii).

Academia is also implicated, the notion of a global environmental crisis appearing in many academic accounts ranging from the mainstream (e.g. the geography text *Global environmental crises: an Australian perspective* by Aplin *et al.* (1999)) to the radical (e.g. Carolyn Merchant's *Radical Ecology* (1992)). In these accounts, whether they have a critical or a positivist basis, the notion of the planet being in environmental crisis is accepted as objective fact.

This conceptualisation of the environment as a problem has become a truism. Adger *et al.*'s (2001) analysis of global environmental discourse illustrates this well. Examining deforestation, desertification, biodiversity use and climate change, the authors identify first a major discourse (narrative) on each issue which advocates global environmental management of that issue, then a contrasting populist narrative that portrays locals as victims of external interventions (eight narratives in total). Every one of these eight, whether managerial or populist, encompasses belief in impending environmental crisis (Adger *et al.* 2001 p. 703). The authors suggest that discourses denying the global nature of environmental problems are less influential (Adger *et al.* 2001 p. 707).

Interconnectedness: recognising the environmental crisis as global

In ecologism, Nature as 'the environment' has become not just as a myriad of unrelated local problems but a looming environmental crisis of global scope. This derives partly from the interconnectedness of humans and from Nature found in humanist perspectives (such as Rachel Carson's *Silent Spring* (c.1962), partly from advances in science and technology that have enabled the extent of environmental degradation to be plotted, and from scientific cooperation that has allowed these to be investigated and addressed on an international scale.

Contemporary awareness that practices in one part of the world can affect the environment in others—phenomenon such as acid rain do not stop at state boundaries—has also helped turn the local into the global. While much of the early analysis of environmental problems assumed problems occurred at state level, there has been a shift towards analysing many issues as transboundary ones. Recognition of the global nature of biospheric and atmospheric systems underpins the phenomenon of global scale environmental change, manifested as increasing carbon dioxide levels in the atmosphere and ozone depletion. By definition, global environmental change is assumed to have consequences for all peoples on the planet; it also means that some of our actions will impact upon future generations. One of its key metaphors is Boulding's (1966) image 'spaceship earth', which so emphatically conveys the impression of a fixed natural-resource base, and which inspired the 1970s environmental movement (Leach and Mearns 1996 p. 4).

With the success of the newly industrialised countries, and with the shift of many industries from developed to developing countries, the environmental impacts of industrialisation are no longer confined to rich western countries. As the scale of industrialisation and urbanisation expands in developing countries and recently industrialised ones, so too do detrimental environmental impacts. Furthermore, lifestyles in rich countries are now recognised as detrimentally affecting the environment

in poor countries, either directly through the export of waste for example, or indirectly when consumption in rich countries drives demand for natural resources from poorer ones.

Underlying this is the idea that environmental dynamics are ultimately linked into an overarching unity—a connectedness. From this has come the fear that the ecological costs of globalising omnivorous consumption may drastically destabilise the biosphere; the earth's resources may not be sufficient for all societies to emulate western consumption patterns (Banuri 1990a p. 31; Dalby 1998 p. 312). From it also comes the fear that in an expansionist economy and society, efforts to respond to one environmental problem invariably exacerbate others (e.g., Ophuls 1977 p. 24-25). This, then, is the global environmental crisis that policymakers are attempting to address through international cooperation, science, and planning.

Environmental degradation as a problem arising out of modernity

Ecologism sees the ordinary and standard practices of modernity as causing large-scale and systematic environmental degradation (Saurin 1993; Vincent 1995). Both mainstream and radical accounts perceive a contemporary global environmental crisis rooted in the dynamics of modern industrial-capitalist societies. For instance, Dryzek (1997), in setting out his typology of modern environmental discourses, sees environmentalism largely as a reaction to the problems of industrialism. Hence, he organised discourses according to how they engage with, and how they choose to address, perceived problems of industrialism, whether through gradual problem-solving or more radical actions (Table 4).

TABLE 4: DRYZEK'S CLASSIFICATION OF CONTEMPORARY ENVIRONMENTAL DISCOURSES

	Type of action required	
Envisaged departure from industrialism	**Radical**	**Reformist**
Prosaic	Survivalism	Problem Solving
Imaginative	Green Radicalism	Sustainability

Source: Dryzek (1997 p. 12-14).

As Forsyth (2003 p. 271) noted, most environmental theorists present environmental degradation as resulting from social oppression associated with capitalism and/or the instrumental reason of modernity. Within environmental sociology, major theoretical traditions stress the potency and immutability of forces heading modern societies towards that degradation (Buttel 1996). So too do Marxist based accounts, in which the notion of environmental crisis derives from the second contradiction of capitalism. Marx identified nature as a condition of production which capital cannot produce for itself as a commodity; in an effort to maintain capital accumulation, the state therefore mediates, thus politicising conflicts around those conditions (Peet and Watts 1993 p. 240). The same view of the capitalist system being the cause of many Third World environmental problems drove early political ecology research. Researchers, explaining situations ranging from soil erosion to herding practices, linked social and economic inequality, political and cultural oppression, economic exploitation and natural resource depletion to capitalism's 'laws' (Peet and Watts 1993; Bryant 2001).

In social science, the idea that modernisation (the advance of capitalism, development, and industrialisation) is causing environmental degradation has assumed the status of a meta-narrative (Forsyth 2003 p. 272).

The representation of Nature underpinning this view of the environment

The contemporary notion that the environment is a problem is based upon a much older representation of nature as a hostile and unruly force, an Other to be controlled and managed (Dalby 1998 p. 295). According to White (1967), that view dates back to the destruction of pagan animism in Europe through the spread of Christianity. Technology such as the plough separated humankind from nature, allowing its exploitation; by destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects (White 1967). It made nature controllable and manageable. Christianity's spread was followed by the Scientific Revolution and the growth of a market culture; these eclipsed a view of Mother Nature as caring and bountiful, replacing it instead with one of nature as a fearsome, wild woman who must be controlled by knowing her (Merchant 1980).

The related idea of nature as a villain recurs in anthropocentric western thought. In this reading, Nature is a potentially unruly and threatening entity, something which must be conquered, controlled, manipulated and exploited for human ends. In ecological writings, Bacon, Hobbes, Descartes and the Enlightenment make frequent appearances as the perpetrators of this attitude (Vincent 1995 p. 221).

In contrast, in contemporary thought, the idea of humans being able to manage nature is intertwined with the notion of nature as being of value and in need of rescue. The latter derives from prominent ecological critiques of modernity dating back to the mid-1960s, particularly Carson's *Silent Spring*. According to Toulmin (1990 p. 160-167) in *Cosmopolis: The hidden agenda of modernity*, those ecological critiques represented the reinsertion of humanism into modernity, showing nature and humanity as ecologically interdependent. In another interpretation, those critiques are populist manifestations of the changing character of ecology: the insertion of mechanistic concepts of science which see nature as a cybernetic system with limits. Kwa (1987) describes how, in notions about ecosystems, the metaphor of nature as an automatic machine, and human relationships with nature as those between an engineer and his machine (explained in the text box below), became dominant in the environmental movement in the late 1960s and throughout the 1970s. Here, the general theme is nature as a system in steady state, the same theme that appears in the belief that if we humans fail to respect this steady state and the limits it imposes on our activities, then we bring about the downfall of the world and of ourselves (Kwa 1987). There are, in this representation of nature, two sub-themes: a complex whole in which everything is connected to everything else, and a whole that will break down once its vital feedback mechanisms are damaged or when humankind loses control.

Systems Ecology: Looking at Nature in Terms of Self-Regulated Systems

In the 1950s, HT (Tom) Odum took existing ideas about ecology and ecosystems and linked them to the physiological concept of homeostatis in a cybernetic formulation (Taylor 1988). Odum reformulated ecosystems as cybernetic systems with self-regulatory feedback loops maintaining that homeostasis, and hypothesised that ecosystems diversity means stability—the more diverse the ecosystem is, the more feedback loops there will be (Kwa 1986 p. 168-170). In analysing representations of nature in this cybernetic formulation, Chunglin Kwa highlighted its implications for environmental management and policy. Although Kwa undertook that analysis in the mid-1980s, it is just as relevant today because the influence of cybernetic ecology continues.

Systems ecologists reconceptualised humans' interference in nature through pollution and overexploitation, using the idea of a control trajectory. This trajectory incorporates the notion that control over stability has limits—if disturbances go beyond that limit, they take possession of the ecosystem. These limits thus form thresholds of prime importance for ecosystem management. Below the upper threshold, overfishing (as an example) is taken as permissible; above, as a major threat to the environment (Kwa 1986 p. 170). Optimalising harvests of fish can be interpreted as adjusting the set point of a cybernetically controlled system. Above a certain grade of fisheries exploitation we speak of overfishing, below inefficiency and waste. The same view can be taken of pollution. Although conceptualising ecosystems as machines suggests a set of instruments by which we may control nature, preventing its collapse and securing its optimal exploitation—allowing us not just to exploit nature but to preserve and repair it— this conceptualisation also has a downside. "Either we succeed in maintaining the delicate control mechanism of nature, or we fail and cause its breakdown" (Kwa 1986 p. 171, 183). Thus the cybernetic representation of nature offers only two future scenarios, either sustaining the nature in which we live, or its destruction (Kwa 1986 p. 182).

Kwa (1987) noted that while, in 1962, Rachel Carson was mocked for her idea of the balance of nature, by 1970, the idea had become part of the general wisdom.

> The concepts of holism and of impending disaster permeate all environmental thinking of this era, although the primary causes of the impending general catastrophe may differ from one another. So Commoner blames world-wide contamination, Ehrlich overpopulation and Dennis Meadows, in his 1972 *Limits to Growth*, reports on a variety of interrelated factors including the previous two and overexploitation of the world's resources (Kwa 1987).

Kwa attributed the acceptance of this idea of nature, and of humans' need to control and manage nature within its natural limits, to the rise of systems ecology as an academic discipline and to its political acceptability; an argument that Sachs (1992) adopted in his critique of environment in *The Development Dictionary*. Cybernetics ecology became politically acceptable in the US in the 1960s during proposals for the International Biological Programme (IBP), ecology's venture into 'Big

Science' (Kwa 1987). Its appeal came from its conceptions of nature and from its belief about the way in which controlling nature was perceived as both feasible and desirable, conceptions already shared by science-policy bureaucrats, scientists and the general public (Kwa 1987 p. 415). "It offered an image of society as a closed system that could be controlled and manipulated from a position outside or superior to the system...[an idea] already part of a more general cultural repertoire, with a specific history among science politicians" (Kwa 1987 p. 425-426, drawing upon Lilienfeld's history of cybernetic ecology). That idea entered policy as ecosystems theory, providing a moral imperative for environmental policy and management: to gauge Nature's overload capacity and adjust her feedback mechanisms (Sachs 1992 p. 31, 32). Moreover, using the machine metaphor for nature supports the view that efficiency, modernisation and 'progress' are highly valued and the cure for perceived inefficiencies is technology (Mühlhäusler 2003 p. 135). In other words, this view of nature confirms the central promises in modernisation theory. It also envisages humans finding solutions to the environmental problems caused by modernisation.

PERCEIVED SOLUTIONS TO THE ENVIRONMENTAL CRISIS

In modernisation's meta-narrative, the environment is conceptualised as something which can be addressed through organised and concerted human endeavour, and as an appropriate focus for policy, showing confidence in humankind's capacity for planning and control, a characteristic of modernist thinking. If a problem exists, then it can be analysed and addressed through planned, co-ordinated approaches: policy formulation followed by action. Yet, the perceived cause of environmental degradation reflects broad-based concerns about the domination of human nature by science, technology and industrialisation rather than more nuanced explanations taking into account social divisions such as gender, caste and age (Conca 2003). This shapes the range of policy solutions being envisaged, in ways I discuss in this section.

The discourse of international environmental policy has modernisation theory's optimism that environmental problems, even those caused by the process of modernisation, can be solved through further modernisation. Having emerged over the two decades following World War II (WWII), when there was a mood of optimism that western countries could help the nations of the Third World 'improve and grow', modernisation theory assumes that Third World nations can move up a development continuum and ultimately reach the pinnacle of development, an emulation of the way in which western societies have developed (Harrison 1977 p. 59-60, 149; Hulme and Turner 1990 p. 37).

Banuri (1990a p. 35) categorises this optimism that environmental problems can be solved through further modernisation as an 'internal critique' of modernisation theory, one that serves to strengthen rather than weaken the theory. The concept of sustainable development has the same optimism and is the product of the same internal critique of modernisation theory (Pretes 1997 p. 1424). As the extent of environmental problems caused by modernisation has been revealed, 'Western society' has responded by mutating the sustainable development storyline, incorporating arguments without fundamentally altering the nature of its conceptions (ibid).

According to Banuri's categorisation, which I use in this chapter to analyse the relationship between various environmental policies and modernisation theory, while an internal critique serves to strengthen modernisation theory, an 'external critique' would call into question the validity and moral basis of modernisation theory as a strategy for humankind's future. It would question the theory's idea of development as unlimited, continuing and endless progress and its optimism of this as the future awaiting humankind. I return to this point about the relationship between the discourse and modernisation theory at the end of the chapter, after analysing the various ways in which the discourse seeks to address the perceived environmental crisis.

Addressing the crisis through science

One of the favoured solutions is science. The combination of scientific advances, the rise of global-scale scientific endeavour, and the "scrupulous discourse" of science has made global-scale solutions to significant environmental problems appear both feasible and desirable (Yearley 1996 p. 100). Moreover, many commentators credit scientific knowledge with creating the momentum for worldwide cutbacks on the production and use of ozone-depleting chemicals, and for wider multilateral consensus on marine pollution, greenhouse gases, biodiversity, and deforestation (Jasanoff 1996 p. 186). So, despite concerns about the effects of technoscience and questions about whether modern science has contributed to widespread environmental degradation, science is widely regarded as being an appropriate way of addressing international environmental problems. Conventional wisdom among environmentalists is that scientific knowledge communicated to people and political leaders will lead to ecologically sustainable societies (Litfin 1994 p. 198). Thus, the conventional response to the charge that science and technology is contributing to environmental degradation is to find better science.

One reason why science is accorded such a central role in solving contemporary global environmental problems is its expert nature: expert knowledge and know-how deemed essential for managing pressing problems such as environmental decay. Another reason is science's claim to value-neutrality; it seems to provide the only forum where nations can set aside differences in favour of a common rationalist problem-solving approach. By cooperating, technical experts can shape and even pre-empt state action. This is the basis for Peter Haas's influential argument that 'epistemic communities', actuated by common professional norms and shared holistic definitions of environmental problems, have set the agenda for international negotiations and have pressured governments towards agreements.

This faith in science is paralleled by a faith in instrumental rationality, seen in the widely-held idea that introducing science, and the objective information that science can provide, into policy processes will facilitate rational policy solutions (efficacious means selected to meet previously-given ends) (Cortner and Moote 1999 p. 77; Sarewitz 2000). This particular view of science rests on the epistemological notion of scientific realism, the idea that scientific knowledge is based upon direct, impersonal, and, in that sense, objective observation of the natural world providing knowledge that we are able to know as the truth (Demeritt 2001 p. 26). Scientific realism not only assumes that there is a 'real' physical world or universe that exists independently of our awareness of it but, by and large, we can know which judgements of this are true (Papineau 1996 p. 2; Audi 1998 p. 239). In other words, we can test that knowledge empirically by referring to how the world actually is (Demeritt 2001 p. 26).

Environmental planning and control: the realm of the professional expert

There is, in global environmental policy discourse, confidence in humankind's capacity for planning and control, as a means of subjugating nature's unruly force (the latter discussed in Dalby 1998 p. 295). The same confidence can be seen in the practices of modern, scientific fisheries management.

MODERN FISHERIES MANAGEMENT: FAITH IN PLANNING AND CONTROL

Modern fisheries management is premised on the idea that, through concepts such as Maximum Sustainable Yield and Maximum Economic Yield, humans can manage fish extraction to optimise economic benefits. This idea arose in the second half of the nineteenth century but came about slowly and only after the acceptance of two interconnected assumptions: the idea that human activity is a primary determinant of the state of fish stocks, and acceptance of the possibility of quantifying human impact on fish stocks (Holm 1996). It was not until well after WWII that a theoretical model representing the fishery was completed, allowing conceptualisation and intellectual analysis of various ways of managing fish stocks (Smith quoted in Holm 1996 p. 179). Modern, scientific fisheries management has thus been built on faith in nature's benevolence and on confidence in humankind's capacity for planning and control. It flourished in the post-war era, state and science combining to discipline industrial capitalism, which left unchecked threatened to destroy the fishery resource through the race to fish (Holm 1996 p. 186). In the 1970s, when increased fishing pressure threatened fisheries, states negotiated a new regime based around 200 mile Exclusive Economic Zones, replacing the regime of *Mare Liberum* and promising to install nation states as responsible fisheries managers, in an effort to end the race to catch the last fish in the oceans (Holm 1996 p. 177). In this revitalised era of order and rationality, fisheries policy first focused on biological regulation, designed to protect fish stocks from overexploitation and potential collapse. As fisheries management flourished, it then adopted the mission of removing open access regimes and creating private property rights over fisheries, something justified as addressing inefficiencies (Kahn 1998 p. 304). It recreated commercial fishers as stakeholders with an interest in the coastal zone and oceans, major players who wanted a key say in state-managed processes addressing pollution of fishery habitat and conflict between user groups (this started in New Zealand in the 1980s).

In the contemporary age, apocalyptic global environmental images warn that current production and consumption trends threaten humanity's survival (Holm 1996 p. 185). Despite this, and despite the fact that much of the earlier optimism and faith in progress has vanished, modern fisheries management is still buoyed by a confidence in humankind's capacity for planning and control. Supported by modernisation theory's confidence that nature can be rescued, modern fisheries management has reinvented itself through new international agreements and by adopting new concepts such as ecosystems management, marine protected areas, co-management, and quality management. The work of improving the science of fisheries management continues, for coral reef fisheries (e.g. as described in Polunin and Roberts 1996; Sale 2002 [1991]) as well as for inshore temperate fisheries and deep sea fisheries (e.g. Kahn 1998 p. 458).

Conceptually, planning is based on the idea of rationality, whereby reality can supposedly be structured and controlled, changed at will (with some external help or force) and the outcomes predicted (Marcussen 2003 p, 2). This is the premise behind a flood of national environmental strategies prepared in developing countries during the 1990s. The idea for these strategies dates back to 1980 when the International Union for the Conservation of Nature and Natural Resources (IUCN), the United Nations Environment Programme (UNEP) and the World Wildlife Fund (WWF), in their World Conservation Strategy *Caring for the Earth*, suggested that countries should prepare such strategies (IUCN *et al.* 1991). National environmental planning did not, however, become routine in developing countries until their emphasis on national planning shifted, under the influence of structural adjustment lending, from macro-economic planning (once common in the form of national development plans), to sectoral planning (Marcussen 2003 p. 3). Large international development agencies funded and co-ordinated a flood of national environmental strategies in developing countries; the World Bank and various collaborating agencies, including USAID, initiated them in Africa. In the Pacific, the Asian Development Bank (ADB), United Nations Development Programme (UNDP), and IUCN funded government agencies in thirteen island states to prepare such strategies (Boer 1992; IUCN 1993).

This faith in science and planning as the appropriate way to address global environmental problems represents a technocratic orientation, also seen in the UN's approach to these matters since the late 1960s. For example, when the United Nations General Assembly (UNGA) first made a resolution on development and the environment in December 1971, it emphasised the importance of rational utilisation of natural resources, rational management of the environment, and rational planning procedures balancing development, environmental enhancement and preservation (resolution 2849 (XXVI), 2026th plenary). Moreover, after the Stockholm conference on the human environment and the decision to found UNEP, both in late 1972, the UNGA sought to focus international environmental cooperation towards technical assistance, training, exchange of information and financial resources for developing countries (UNGA Resolution 2849 (XXVI) 20 December 1971). This perspective reflects the modernist commitment to problem-solving, in which knowledge is not pursued as a goal in itself but to help resolve particular societal problems (Hajer 2003 p. 177).

This technocratic approach has long coloured studies of international environmental policy and environmental regimes, including geography studies (Redclift 1994; Bryant and Wilson 1998; Castree 2002). It also appears in policy science, as a perception that international policy is a problem-solving endeavour, rational in nature, requiring cooperative arrangements amongst various stakeholders (for instance, Anderson 1984 p. 3; Coleman and Perl 1999 p. 697; Hajer 2003 p. 181, 187). This technocentric mode of environmentalism, defined by progress, rationality, and a sense of optimism and faith in humankind's ability to understand and control nature, is the realm of the professional expert (O'Riordan 1976 p. 11-19). As both a problem and a global commons, the environment requires 'global experts' (Goldman 1998 p. 2-4).

The roots of the technocratic orientation to policymaking

O'Riordan specifically linked the rise of a professional élite, and the attendant regulatory bureaucracy in environmental matters, to Roosevelt's Progressive Era in the USA at the beginning of the twentieth century and to the rise of the rational management movement in that era. This is, however, only one of several roots suggested for the contemporary technocratic orientation to environmental issues. Others have suggested that in the UN's efforts to centralise international environmental policy, and those of major conservation organisations to modernise international conservation through science and rational planning, one can see the legacy of the strong belief in scientific and technical progress associated with the industrialisation of Western Europe and North America from roughly 1830 until World War I (see Escobar 1992 p. 134; also Scott 1998 p. 89).

Radical critics of modernity have linked this technocratic orientation to policy to the Enlightenment, whereby science since Bacon and Descartes has enshrined a manipulative division between human beings and nature (Vogler 1996 p. 17). This reflects policy-making's legacy of Enlightenment rationalism and positivism, schools of thought that seek to develop detached, scientific knowledge to improve human conditions. Rationalism and positivism are based on the belief that society's problems ought to be solved in a 'scientific' or rational manner by gathering all relevant information on the problems, identifying possible alternative solutions to them, then selecting the best alternative. Because of its problem-solving orientation, this approach is known as 'scientific', 'engineering', or 'managerialist' (Howlett and Ramesh 1995 p. 140). This is policy serving the function of planning and controlling the future. There are similarities in the idea of bureaucratic rationality, which dates back to early US and British attempts to establish a science of organisational behaviour and public administration, and is now formulated as the sociological theories of organisation and industrial society found in contemporary management science (Howlett and Ramesh 1995 p. 139; Parsons 1995 p. 399, 428).

Several notions sharing this technocratic orientation have dominated the discipline of policy science over the years, starting with Herbert Simon's post-World War II idea of examining decision-making as a series of rational stages. Simon's ideas evolved into a model depicting a top-down instrumentalist, linear decision-making process with defined stages (agenda setting, policy formulation, decision-making, policy implementation, and policy evaluation) (Howlett and Ramesh 1995 p. 9-12; Parsons 1995 p. 77-78). This was based on the belief that policy-makers go about solving problems in a very systematic and more or less linear fashion, an idea that influenced later models which combined rational stages and systems approaches, and which still dominate policy analysis (Parsons 1995 p. 24). These models are predicated on problems first being recognised, then addressed. This same view can be seen in the notion that the process of integrating science into policy is necessarily linear and progressive, starting with the identification of a problem and proceeding through scientific research and predictive modelling, whereupon policies are developed and solutions reached (as described in Sarewitz 2000).

The idea of policy as rational justification is derived in part from idea that government could, by making policies, 'solve' problems, something John Maynard Keynes promoted (Parsons 1995 p. 17).

Keynes legitimised the view that the state should have a more interventionist role in social and economic problems: government should address those aspects of society and economy that cannot 'technically' be done by individuals, and should do so in the public interest (Parsons 1995 p. 8-9). This notion underpinned the welfare state with its suite of government policies intended to shape society and the economy, common in developed countries after World War II. Thus the rational, state co-ordinated approach to policymaking reflects the preoccupation of the state with national security, development and, post-war reconstruction. But, probing deeper, Nandy (1992) argued that the idea that the state represents scientific rationality is one of the major themes in the ideology of the state. Furthermore, the idea that the state represents scientific rationality rationalises the action of the state which is, in turn, seeking to rationalise the society it lands over.

A cooperative approach

As well as science and technological rationality, international cooperation also looms large in contemporary approaches to the perceived global environmental crisis. The WCED report, the Hague Declaration of 1989, and the 1992 United Nations Conference on Environment and Development (UNCED) all singled out international cooperation as a key determinant of sustainable development. These and many other reports on global environmental problems uncritically accept international cooperation as part of a natural quest for planetary order. This has been the dominant view in mainstream International Relations theory, at least until the US government of George W. Bush lost interest in leading the international community on environmental issues (Vogler 1996 p. 7-8; Ford 2003 p. 121-122; Wapner 2003 p. 7-8). This uncritical acceptance of international cooperation as the way things are is also found in policy science, in the view that cooperation among states, intergovernmental and non-governmental agencies is a way of overcoming environmental problems and coordinating 'management' of the global environment through the harmonisation of interests, assumed to be beneficial for all (Howlett and Ramesh 1995 p. 1999).

In international environmental policy documents and in mainstream accounts of these policy endeavours, it has been unusual for this cooperative approach to international environmental issues to be expressed explicitly in the language found in International Relations' analyses of security (Sutherland 2000 p. 187). Since the 1980s, there has, however, been a growing body of literature that analyses international environmental issues in those terms (recent examples include Dalby 1996; 1998; 2003; Litfin 1999; Sutherland 2000; and Elliott 2004b; 2004a). These analyses make clear that the dominant approach being taken to managing global environmental problems is cooperative security based upon recognised interdependence and commitment to joint survival, fostered by promoting dialogue and encouraging both multilateralism through international regimes and compliance with international strategies (Sutherland 2000). WCED, the 1995 report of the Commission on Global Governance, the Declaration of the UN's Millennium Development Summit in 2000, and the 2002 Johannesburg Declaration of the World Summit on Sustainable Development (WSSD) all promoted this view in various guises (Commission on Global Governance 1995; Elliott 2004a). Liberal, institutionalist International Relations literature fosters it.

One manifestation of this cooperative approach to collective environmental security is the number of inter-state environmental agreements signed since the 1960s, now numbering around 500 (Wapner 2003 p. 6). Broadhead (2002 p. 23) labelled these multilateral efforts to form collaborative agreements that establish bureaucratic controls limiting human action in the interests of environmental protection, as 'green diplomacy'. This regime-based approach is premised upon belief that incremental change, achieved through multilateral diplomacy, with arguments based on solid knowledge, is the best approach to achieving an ecologically sound world order: from incremental change will come a new, norm-rich, sustainable world (Broadhead 2002 p. 1). Largely technocentric, this approach treats the environment as a problem needing to be solved, environmental issues often being framed solely in terms of the problems to be addressed, separated from any consideration of social and economic processes (Broadhead 2002 p. 16). These are the politics of ecologism described in Chapter One.

As well as international regime formation, solutions to a perceived global environmental crisis have taken three other main forms (1) policy diffusion, lesson-drawing and capacity-building; (2) projects combining conservation and development; (3) neoliberal, market-based approaches. All require international cooperation. I address each in turn.

Interstate and intergovernmental organisation-state cooperation in policy matters commonly takes the form of lesson-drawing, particularly when developing countries are involved. By learning from overseas, governments may orient their own policies to what is already being practised in other countries, a phenomenon also called policy diffusion (Howlett and Ramesh 1995 p. 40; Jörgens 2001 p. 122). Both policy science and development studies describe international policy as a lesson-drawing (learning) venture for developing countries, entailing learning appropriate responses to problems and reproducing appropriate institutions to address those problems. Developed countries and international organisations—those with expert knowledge and experience in addressing issues—help developing countries characterised as lacking experience, knowledge, and political will. These concepts were the basis of the Bretton Woods settlement establishing the International Monetary Fund (IMF) and World Bank, organisations that are having a significant impact on environmental policy in developing regions.

Lesson-drawing is believed to be playing an important role in contemporary development; aid programmes often aim to transfer policies and institutions to developing countries. The concept of capacity-building is similar.

> In order to spread their particular approach to green science and environmentally sustainable development, Northern aid agencies and banks have invested in 'capacity building' in borrowing countries. These funders have given birth to or helped support research institutions, training centres, and national science and policy agendas... Enormous flows of money (relative to GDP [gross domestic product]) stream into borrowing countries to restructure and 'modernise' state agencies and institutions (Goldman 2004 p. 71).

Placed on the development aid agenda in the 1990s (its history summarised in Degnbol-Martinussen and Engberg-Pedersen 2003), the capacity-building project was originally preoccupied with building national institutions. It has now been extended to include civil society—NGOs, grassroots organisations and research agencies.

Contemporary paradigms of both development and international environmentalism promote policy diffusion, lesson-drawing and capacity building as a way of assisting developing countries to better manage their environment—people trained in developed countries teach those in developing regions appropriate policy, methods of environmental management, and techniques in everything from research and information management to planning and community consultation. Through their development aid programmes, United Nations (UN) agencies, the World Bank and other aid agencies have promoted this policy of building institutions and reinforcing national capacities and professional skills. Applied to the environment, this blueprint approach has been labelled as 'environmental managerialism' (Redclift 1994; Adger *et al.* 2001 p. 701-705).

In the Pacific Islands over the last fifteen years, considerable international efforts in this vein have been directed at improving technical aspects of environmental management and policy. There have been projects for developing national environmental laws and guidelines; institutional strengthening of national agencies in order to implement these laws; capacity building aimed at improving skills of people in government agencies and local non-governmental organisations (NGOs) through training and education; and, latterly, community conservation—encouraging communities to establish conservation measures. These are described in Boer (1996), Alley (1999), Herr (2002), SPREP (2002), Baines (2002) and Veitayaki (2003). Capacity building, in particular, often occurs after these island countries have signed multilateral agreements that provide for the practice and establish funding for it.

The practice of capacity-building, as well as the diffusion model of policy, reflects modernisation theory's concept of a universal and natural developmental sequence through which all cultures must pass but through they can be assisted (originally described in Rostow 1956). "The oft-noted implication is that the velocity of this unfolding modernisation can be increased through 'aid' and 'assistance', coming from those already having traversed this path" (Blaney and Inayatullah 2002 p. 104).

This practice of supplying green aid has broadened beyond the ambit of UN agencies and state agencies from developed countries. Quasi-independent international science-based agencies are also involved, an example being the Consultative Group on International Agricultural Research (CGIAR) group. This informal association of sixty-three independent public and private sector members was created in 1971 and is sponsored by the World Bank, the Food and Agriculture Organisation of the United Nations (FAO), UNDP and the International Fund for Agricultural Development (IFAD)).

Furthermore, policy approaches being developed by conservation NGOs now feature on an international environmental policy agenda previously dominated by UN agencies and their advisers in science-based agencies. This has come about as a result of the greening of international aid since the 1970s when environmental considerations became an integral part of many development aid programmes and the focus of specific projects. This led multilateral and bilateral development agencies to form partnerships with environmentally-focused NGOs with the required skills to deliver environmental programmes to developing countries (Hardie-Boys 1999 p. 187-188). Additionally, the recent practice of representing NGOs as a global civil society, a credible voice that educates the public about issues of importance and mobilises concerned citizens, has helped these organisations enter this international policy arena. Their approaches also favour international cooperation.

One such example is the attempt to reconcile human development needs with conservation actions and the conservation of natural systems, which became fashionable amongst major conservation NGOs in the late 1990s. Echoing topical ideas from development discourse, efforts to marry conservation and development have taken various approaches including meeting the basic needs of local communities and searching for alternative livelihoods. The following box describes WWF's approach to marrying the two concepts by searching for the root causes of biodiversity loss. The Global Environment Facility (GEF) and WWF-US' macroeconomic office developed that idea, drawing upon the work of Timothy Swanson, a Cambridge economics lecturer (Wood *et al.* 2000).

MARRYING CONSERVATION AND DEVELOPMENT: THE WWF EXAMPLE

WWF describes its efforts to marry conservation and development as tackling poverty and looking for ways to sustain and/or improve the livelihoods of local communities.

> WWF has long believed that poverty cannot be eliminated in the long term without protecting the environment and that the environment cannot be protected without tackling poverty... WWF will work in partnerships that reduce poverty inequity while also tackling biodiversity loss and environmental degradation. This will be achieved through building the capacity of local communities and NGOs, mainstreaming environment in planning and policies, and promoting environmental awareness and education (WWF South Pacific 2003b).

WWF has linked discourse about meeting human development needs with the idea of identifying root causes of biodiversity loss, creating a single mission. It categorises root causes as being either demographic change, poverty inequality (between developed and developing regions), [inappropriate] public policies, macroeconomics policies and structures (an argument for neoliberal policies), or social change and development.

> Behind the proximate causes of biodiversity loss and environmental degradation, lie a variety of social, economic and political and cultural factors that influence resource-use decisions at local level. To successfully halt biodiversity loss, one must understand and address these underlying root causes. These socio-economic root causes can be primarily focused into five main areas: demographic change, poverty inequality, public policies, macroeconomics policies and structures, and social change and development. WWF can, by utilising an analytical approach to identify the root causes, describe various parts of the complex puzzle... that linked together drive biodiversity loss and environmental degradation in a particular area (WWF South Pacific 2003b).

The concept of searching for root causes of biodiversity loss is based upon the positivist assumption that the aim of natural and social science is to identify causal relationships in an objective world; positivism 'pretends' cause and effect can be known in such matters. This is a modernist approach: for modernists, the application of reason, exemplified by science, enables humans to discover *the* truth about the nature of reality, to understand the causes of social life in the same manner through which

natural science has revealed the workings of Nature (Jones 1993 p. 109 emphasis in the original). In Banuri's language, this shift in the approach of international conservation towards a marriage of conservation and development is another internal critique of modernisation, designed to strengthen modernisation theory's theoretical basis in the face of the challenge posed by Third World resistance to 'locking up areas' as parks and reserves.

Another mainstream approach to addressing shared environmental crises is that of neoliberalism. Neoliberal approaches to environmental policy assume that market structures, if properly managed, will respond to the problems of environmental degradation, by developing responses along ecologically sustainable lines (Broadhead 2002 p. 23). Contemporary international examples of this approach include industry-based voluntary environmental measures, some based upon the International Organisation for Standardisation's ISO 14000, as well as other third party certification schemes such as that of the Forest Stewardship Council. These schemes do not appear magically out of the marketplace; developing and instituting them on an international scale requires cooperation, often between states and specialist organisations set up for the purpose.

Neoliberalism has its roots in liberal orthodoxy, and shares the latter's view of the expansion of modernity and the acceleration of global processes of development as the solution to numerous global problems. Neoliberalism thus subsumes into modernisation theory the threats to progress posed by industrialisation and consumerism, turning them into challenges which modernity can overcome. It, too, is an internal critique of modernisation theory, as Banuri (1990b p. 39, 63) identified: "a reassertion of the ideological purity [of neo-classical development thought] which has been lost during piecemeal concessions to alternative views". Whilst it may be difficult for some to see neoliberalism as a policy tool advocated by modernisation theory, it shares that theory's faith in progress and development through economic growth believed to follow once the 'right' policies are implemented.

Indeed, all these policies normalising cooperation in matters of international environmental policy—green diplomacy, policy diffusion, capacity-building, government-industry-NGO partnerships efforts to marry conservation and development, and neoliberal policy approaches—can be construed as a defence of modernisation theory against criticism of the environmental effects of modernisation. They all depict environmental problems as capable of being addressed through cooperative human endeavour, organised under a rationally-derived, co-ordinated policy framework, and aided by science and technology. Accusations of failure are disregarded as resulting from weakness not in the theory of modernisation but in the application: the endurance of backward behaviour, values and institutions; inefficiency, self-interest or venality of politicians and bureaucrats; or too much state intervention in domestic economic matters such as control over foreign investment (Banuri 1990a p. 30).

DEVELOPING COUNTRIES AS SITES FOR ENVIRONMENTAL INTERVENTION

Modernisation theory is being used to imagine the environmental problems of developing countries as requiring international intervention. Complex and variable global images as well as arguments about security posed by environmental degradation and the need for sustainable development and universal human rights contribute to this imagination (Sutherland 2000). So too does pervasive

developed/developing and North/South imagery—the poverty-stricken, eager-for-development countries of a stylised global South contrasting with the affluent, industrialised, democratic countries of an equally stylised global North (Conca 2003 p. 81). In addition, developing countries are being created as sites for western, expert intervention through arguments about the need for, and right to, development despite its effect on the environment, and arguments about the environment being a matter of common responsibility (or similar concepts). In this section, I dissect those arguments.

Modernisation theory as a justification for intervention

Explanations of the relationship between environmental degradation and the stages of modernisation that developing countries occupy are inconsistent. In the early 1970s, shortly after the UNGA first linked environment and development issues in a single agenda, that body critiqued modernisation as causing environmental degradation in developed countries. At the same time, it attributed environmental problems in developing countries to a lack of modernisation—specifically a lack of economic resources for dealing with the environment in an appropriate way (see UNGA Resolution 2849 (XXVI) 20 December 1971). In 1987 the WCED report, adopted by the UNGA, propounded this view. Many commentators, before and since, have expounded and refined it, arguing that as long as people live in poverty or in unjust and inequitable societies, they will have little alternative but to put increasing pressures on the environment. In particular, the 2002 World Summit on Sustainable Development reiterated the WCED's link between poverty and environmental degradation.

This attitude is one of blaming the victim. Sachs (1992) observes that this attitude has allowed the recipe of growth to be extended—growth being seen as the solution to the environmental problems of deforestation and desertification in poor, undeveloped regions of the world. "Since growth was supposed to remove poverty, the environment could only be protected through a new era of growth" (Sachs 1992 p. 29). Thus in the 1980s, the idea of development being an essential precondition to environmental sustainability entered an international aid agenda previously focused on stimulating economic growth (Overton 1999; Degnbol-Martinussen and Engberg-Pedersen 2003 p. 25-28).

Contrast this with the widely-held belief that the process of modernising developing countries is causing environmental degradation, a belief found in intellectual disciplines ranging from environmental sociology to neo-Marxist political ecology, as discussed earlier in this chapter. This is fear of the geographical march of modernisation—a Northern anxiety that, in the South, rapid scientific and technologically-induced changes on humans and the environment will induce environmental degradation on at least as great in scale as that when the North industrialised (as discussed by Darier 1999 p. 2).

Thus, both a lack of modernisation, and the ongoing process of modernisation serve to justify international intervention in environmental problems of developing countries—reflecting, alternately, nature as unruly and hostile, and nature in need of rescue, views discussed earlier. In both these arguments, the South is blamed for its environmental problems. In contrast, the discourse of Third Worldism blames the North, specifically the latter's patterns of resource extraction, industrialisation and consumption.

Third Worldism came to the fore at UNCED, in the Rio Declaration. Principle 7 of that declaration states: "The developed countries acknowledge the responsibility they bear in the international pursuit of sustainable development in view of the pressures their society place on the global environment and of the technologies and financial resources they command". This is further supported by Principle 8 in the same declaration, which states that States shall reduce and eliminate unsustainable patterns of production and consumption. This Third Worldism grew out of the 1960s 'dependency school', a loosely defined grouping of intellectuals from various disciplines who shared opposition to modernisation theory and to US policy, plus a sympathy for Third World liberation struggles (Rist 1997 p. 109-110). In the 1970s the idea of a New International Economic Order focused attention on the gap in living standards between developing and industrialised countries, its Third World proponents arguing that this gap must be bridged (Rist 1997 p. 169-170). More recently, attempts by dependency theorists to blame environmental degradation of the South on the North have faced significant opposition from the North. Several industrialised states, the US included, do not consider the principle of common but differentiated responsibility to be a general norm of international law imposing any duties between states (Maggio and Lynch 1997). At WSSD, US representatives attempted to water down the legal implications of those principles agreed at UNCED.

Thus, modernisation theory again reigns supreme in the discourse of global environmental policy, the cause of environmental degradation being the process of modernisation, and the solution being international cooperation, rational planning, technocratic solutions and so forth. The North are heroes because they are dealing with it through their technology, their research, their regulations, their legal and education systems and so forth, while any southern countries that resist northern solutions are regarded either as a bit backward and slow or as villains for mounting such resistance.

Moreover, linking development with environmental management has created developing countries as sites for intervention and has given the UN a general mandate for intervening in the environmental problems of developing countries. There was, and still is not, any comparative general mandate for intervening in developed countries, as the South Centre recently pointed out:

> [Developing countries] find themselves on the defensive and under increasing pressure and scrutiny by the North—its governments, its businesses, its civil society, its media—and by multilateral institutions often under the impulse of the North, regarding environment-related policies. At the same time, except for the domestic pressures of their own increasingly influential civil society groups, specialising in given aspects of environmental policy, or of the green political parties, the developed countries themselves are well-sheltered, and for all practical purposes are out of multilateral reach and disciplines as regards their own actions and obligations, with the countries of the South, individually or collectively, having no leverage on them at all (The South Centre 2002 p. 5).

(The Centre is an intergovernmental organisation of developing countries, formed in 1995 to promote South solidarity, consciousness and mutual knowledge and understanding; it is based in Geneva.)

The issue of security

Images of an endangered planet (nature in need of rescue) position developing countries as subjects of global environmental concern (Sutherland 2000). This is seen in the articulation of environmental

degradation as being a threat to national security because it (supposedly) prompts conflict, large scale migration and refugee movements, an articulation described in Dalby (1996) and in Sutherland (2000). This positioning is also seen in the neo-Malthusian fear that rising populations in the South are driving global change and will deleteriously spillover onto the North (Dalby 2003 p. 40).

In this view, the areas variously labelled as the 'South', the 'Third World' or 'less-developed regions' are a potent source of new dangers and destabilisations. This is difference posited as both inferiority and danger, found in many places (Slater 1999 p. 65-66, 77). This view of the environment as a security threat has been topical since the Cold War, particularly in the US (Dalby 1996). Combined with a conviction that external threats can be overcome through the spread of development, this thinking justifies international intervention in developing countries. It echoes the thoughts of those who, in designing the post-war project of 'development' and 'modernisation', saw that project as a barrier against the destabilisation of the fluid, expansionist ideology of Communism (the latter identified in Slater 1999 p. 76-77).

The environment as a matter of common concern

The third way in which the environmental problems of developing countries are being positioned as global problems is through the notions of the environment being a matter of common concern to (hu)mankind, the common heritage of (hu)mankind, and a matter of common responsibility, ideas that are reflected in international environmental law. Of these, the concept of the environment as a common responsibility entered international law first, as described in the text box below.

THE CONCEPT OF COMMON RESPONSIBILITY IN INTERNATIONAL ENVIRONMENTAL LAW

The concept of common responsibility—the shared obligations of two or more states towards the protection of a particular environmental resource— has evolved from an extensive series of environmental laws since 1949. In that year, tuna and other fish were described as being of common concern to certain parties by reason of their continued use. Later examples include outer space and the moon, described as 'the province of all mankind'. Waterfowl are described as 'an international resource'; the conservation of wild animals is described as 'being for 'the good of mankind'; and the resources of the seabed and ocean floor are 'the common heritage of mankind'. More recent examples are in the Climate Change Convention which acknowledges that 'changes in the Earth's climate and its adverse effects are a common concern to humankind'. The Convention on Biological Diversity affirms that 'biological diversity is a common concern of humankind'.

Source: UNEP web site at www.unep.org/Documents/; Basler (1998); Centre for International Sustainable Development Law (2002)

In 1967 the Maltese delegate to the UN, Ambassador Arvid Parvo popularised the concept when he suggested to the UNGA that the deep seabed and ocean floor and its resources be declared the common heritage of mankind (Basler 1998 p. xix). Parvo was using the term in the context of international areas beyond national jurisdiction. A bloc of developing states subsequently employed the concept to promote inter-spatial equity and benefit-sharing (amongst people of the present generation) in an effort to get rid of the shackles of colonialism and underdevelopment (Basler 1998 p. 277-278). This notion of the common heritage of (hu)mankind revived a medieval sense of mankind predating the emergence of the law of nations when the Holy Roman Empire broke down (Basler 1998 p. 8-9). It reflects the idea that all guidance for men can be found in higher value and ideas, in the conscience of man, in the eternal will or divine commandment, in justice, human values and international solidarity (ibid). It is also found in late 18th to early 19th century Kantian and Hegelian liberal concepts of 'universalism', discourses that instilled a sense of universal identity in people of different nations (Frid 1998).

From the early 1980s, the phrase 'the common heritage of mankind' became a tool for international lawyers to protect the global environment (Basler 1998 p. 277). They used it in the same sense as environmentalists and politicians: to refer either to all living and non-living resources wherever they are, or to the global environment at large as a transnational ecological entity (Basler 1998 p. 280). This use is seen, for instance, in the argument that all biodiversity must be protected through international efforts because it represents the common heritage of humankind. Used in this way, the concept depicts states as custodians of the environment, under the obligation to protect resources within their jurisdiction for the benefit of all: a sharing of responsibilities rather than benefits. Since many of the areas being labelled as biodiversity hotspots are in developing countries, this argument—that the biodiversity of many developing regions is special and the common heritage of humanity—has served to draw those regions into the international policy sphere (Peuhkuri and Jokinen 1999). It has created a mandate for outside experts to intervene in the name of biodiversity protection.

Since the early 1980s, the idea that nature of biodiversity is the common heritage of humankind has been used to restrain those in developing nations seeking to exploit their own natural and cultural resources. This has been done in the name of sustainable development, the human right to environment, and intergenerational justice. Yet, the idea conflicts with the belief that sovereign states have the right to formulate their own policies. In 1971 in its preparations for the Stockholm conference on the human environment, the UNGA affirmed the sovereign responsibility of states. Resolution 2849 (XXVI) stressed that each country has the right to formulate, in accordance with its own particular situation, and in full enjoyment of its national sovereignty, its own national policies on the human environment. It cautioned that in the exercise of such rights and in the implementation of such policies, due account must be taken of the need to avoid producing harmful effects on other countries. The 1972 Declaration of the UN Conference on the Human Environment (Principle 24) further affirmed this sovereign right, as did the 1992 Rio Declaration (Principle 2).

Green diplomacy has yet to successfully address this conflict between the idea of state sovereignty over territorial environments and the idea that, through international cooperation transcending political boundaries, we can address problems threatening the planet. Instead, there has been a trend towards

using softer terms, with lesser legal baggage, to convey much the same notion (Basler 1998 p. 314). This can be seen in the preamble to the Convention on Biological Diversity (CBD), which proclaims that biological diversity is a 'common concern of humankind'. Although the preamble recognises that states have sovereign rights over their own biological resources, it affirms their responsibility for conserving their biological diversity and using their biological resources in a sustainable manner.

Both the notion of capacity-building, and WSSD's concept of partnerships sharing skills and expertise, are helping bridge this conceptual and legal gap between state sovereignty and nature as the common concern of humankind. A topical example is the Asia Pacific Partnership on Clean Development and Climate, formed by the US, Australia, China, India, Japan and South Korea, announced at Association of South-East Asian Nations summit in July 2005. Instead of the fixed targets and caps of the Kyoto protocol, the UN treaty on climate change, this partnership promises technology transfers from developed to developing countries to reduce emissions of greenhouse gases (The Economist 2005). The approach of 'marrying development with conservation', described earlier, is also helping bridge this conceptual and legal gap between state sovereignty and nature as the common concern of humankind. These approaches justify international cooperation in policy matters as well as operational projects. Intellectually, they challenge the potency and immutability of the forces heading modernising societies towards environmental degradation. Morally and politically, they affirm the right of developing countries to development, expressed in the Rio Declaration (principle 3). This is yet another example of how modernisation theory has assimilated the challenges posed by environmental degradation.

History and Context of the Discourse

SITUATING THE DISCOURSE

To recap, our conventional perceptions of international environmental policy are being shaped by a discourse that sees global environmental problems as solvable through globally co-ordinated action drawing upon science and rational planning and utilising the approaches of green diplomacy, policy diffusion, capacity-building, partnerships efforts to marry conservation and development, and neoliberal policy approaches. This discourse is similar to another contemporary policy-oriented discourse of environmental politics, ecological modernisation, a discourse described by Hajer (1995). Ecological modernisation identifies the institutions of modernity not only as the main cause of environmental problems in industrialised countries but also as the principal instruments of ecological reform. There is an associated body of theory which argues that, in these countries, the institutions of modernity are being transformed through the process of ecological restructuring (Mol 2003 p. 309). This theory draws on the concept of reflexive modernisation, brought into present-day social theory by sociologists Ulrich Beck and Anthony Giddens. Ecological modernisation is interpreted as the reflective organisation of industrial society's institutions to cope with the ecological crisis (ibid). The discourse of global environmental policy can be seen as applying the precepts of ecological modernisation to the Third World. It has arisen because industrial society sees not just itself, but the entire developing world as it modernises, as a risk society *sensu* Beck. Western experts set out to

critique and reform not just western society but the rest of the world. Ecological modernisation and international environmental policy are thus part of the same family of discourses about modernisation.

As in other discourses, there are internal tensions and contradictions. Market-based neoliberalism contends with sustainable development, for instance (Dryzek 2001 p. 15). There is also tension between, on one hand, the rights based approach (the common good), which reflects humanist elements in modernist thinking and, on the other, the rationalist thinking reflected in rational planning and the logical positivist search for certainty search in root causes. And the need for international cooperation may no longer be so taken-for-granted now the US government has lost interest in, or has seen its own national interest opposed to, collective environmental well-being (Wapner 2003 p. 7). In its first term alone, George W. Bush's administration pulled the US signature from the Kyoto protocol, attempted to disavow agreements negotiated at the Cairo Summit on population, attempted at WSSD to water down the legal implications of principles agreed at UNCED and weakened many domestic environmental regulations that articulate with global ones (Wapner 2003 p. 7-8). Nevertheless there is a strong internal consistency in the discourse's central themes. Furthermore, its history is clear, as are key conditions of existence, the political operations that permitted its formation, as I show next.

The context: developmentalism

This global environmental policy discourse expresses the dominant philosophy of the modern world-system, 'developmentalism'. The constitutive processes of developmentalism are modernisation, economic growth and nation state building; its core metaphors are progress, growth and development (Adams 2001 p. 149-150). Developmentalism is rooted in the rise of the West, in the history of capitalism, in modernity, and in the globalisation of Western state institutions and cultures (Crush 1995 p. 11). It has an evolutionary perception of development, seeing it as directional and cumulative, predetermined and irreversible, and necessarily progressive (Adams 2001 p. 150). This derives from the original idea of development, which according to Cowen and Shenton (1995 p. 29), was invented amongst the throes of early industrial capitalism in Europe as a counterpoint to 'progress' when the latter was seen as creating disorder. The concept of development emerged to create order out of the social disorder— rapid urbanisation, poverty and unemployment—apparently caused by progress. While progress was seen as a complex, cyclical tableau of processes of improvement and deterioration, development provided a more optimistic account of humankind's interaction with the environment. Human history could thus follow the arrow, rather than the cycle of, progress; social order could be restored (Cowen and Shenton 1995 p. 29; Crush 1995 p. 11; Hughes 1995 p. 5). Thus, development provides an alternative account of history, telling how humans can overcome the limitations of their natural environment, of how nature can be controlled and improved to enhance the quality of human life, and problems can be solved given human ingenuity, resources and time (Mühlhäusler 2003 p. 110-111). In development theory, this view of development has been translated into modernisation theory.

Modernisation theory was out of favour for a time after dependency theorists recognised that Third World countries go through different development stages to those of the First World and argued that the West's capitalist development was causing Third World underdevelopment. Latterly however, the view of modernisation as a progressive, evolutionary process encompassing the Third World has been

on the resurgence. Increasingly common since the putative end of the Cold War, it appears in claims that globalisation is formenting a global civil society; it also appeared in pre-September 11 assertions of a spreading liberal zone of peace (Blaney and Inayatullah 2002 p. 103-104).

Global environmental policy discourse as a critique of modernisation

Although the discourse conceptualises the environment as a problem, it has modernisation theory's optimism that environmental problems, even those caused by the process of modernisation, can be solved through further modernisation. The discourse is optimistic about addressing the challenges that development poses to the environment, through strategies for sustainable development and environmental management, linking conservation to development aspirations and practices, and by using such approaches as capacity-building and neoliberal instruments. This optimism was reinforced by the shift in the aid agenda in the 1980s, towards blaming poverty in undeveloped countries for global environmental degradation, which confirmed modernisation theory as containing the panacea for that degradation. Thus, efforts to find ways of addressing the problem of environmental degradation in the Third World have strengthened rather than weakened modernisation theory.

The global environmental policy discourse exhibits not just modernisation theory's view of international development as an inevitable rather than a chosen process, but also the same teleological notion of universal benevolence as the metaphor of globalism. Globalism sees development in the 'developing world' as inevitably following the superior path of development pursued by the 'developed world' (Marcuse 2004 p. 810).

In its optimism, modernisation theory combines the allure of development—the vision of unlimited, continuing and endless progress—with the charismatic, utopian promise of a unified humanity transcending past environmental problems and limitations. This is attractive not just to those fearful of disintegrating environment in developing regions and concerned to save the world's biodiversity. It is also attractive to those in the Third World chasing their right to development. Being so universally appealing, this vision helps reinforce global order, for, as Dryzek (2001 p. 15) noted, order in international systems is the product of discourses.

FACTORS CRUCIAL IN THE DISCOURSE'S FORMATION

Foucault suggested discourses are distinct because they have distinct histories (McHoul and Grace 1998 p. 49-50). Certainly, the post-WWII theorisation of modernisation in the USA, with its idea of development as continuing, unlimited and endless progress, was crucial for the formation of the global environmental policy discourse. Although modernisation theory is a post-war phenomenon, the development project certainly is not. Drawing on historical accounts, Goldman (2005 p. 11-13) describes how development was an important colonial question phrased in terms of 'how to improve the colonial subject' in order to serve the metropole more productively and how the Bretton Woods institutions were built upon prior colonial and imperial architecture.

As an antecedent of modernisation theory, the colonial development project laid the foundation for the global environmental policy discourse. Indeed, in the Pacific, many countries became independent after the discourse was formed in the late 1960s and early 1970s. Colonialism set the scene for this discourse

in another sense as well, through post-colonial attitudes. By a process of internalisation, colonised subjects experience inferiority not just in external terms but in a manner that affects their sense of their own identity (a manner described by Fanon (1989)). These attitudes have rendered Third World people the victims of environmental problems in their own countries, incompetent in matters of their own infliction and in need of expert help.

In the late 1960s, two different sets of events at the UN were seminal in the formation of the discourse. The first relates to decisions taken during the preparations for the conference on the human environment held in Stockholm in 1972, specifically the decision of the UN Economic and Social Council and later the UNGA to combine environment and development. At a preparatory committee meeting at Founex in Switzerland in June 1971, a committee of 27 experts sought to allay the concerns of developing countries about the economic effects of environmental protection policies. The panel proffered assurance that environmental protection would not go against their interests and would not affect their position in international trade (e.g. by anti-pollution barriers), and that rapid industrialisation could still be pursued but in such a way that its most adverse effects were avoided (Adams 2001 p. 55). The so-called Founex panel of experts produced a report which made it clear that environmental considerations should be an integral part of the development process (Founex 1972). This was something the UNGA affirmed at its 26th session in December 1971 (resolution 2849 (XXVI) discussed above).

The second set of events centred on Parvid's success in persuading the UN to incorporate the concept of the common heritage of mankind in the UN Convention of the Law of the Sea; from this has sprang ongoing debate, lobbying, and negotiations about equity and inequity, common responsibility and special treatment, and common heritage. Those political decisions at the UN led to the proliferation of environmental treaties since 1972, treaties based upon the belief that environmental problems could be addressed through the formation of environmental regimes.

The development of cybernetic ecology, and its acceptance into western environmental politics was another factor crucial for this discourse's formation. In ecology, the marriage of reductionist science—a positivist methodology and a search for general laws of nature—lent scientific credibility to the mission of saving the planet (Sachs 1992 p. 30-31). Furthermore, the notion of ecosystems as a complex of interconnected entities allowed the focus of both environmental science and politics to expand from a national to global level (Dalby 1998 p. 296-297). The concept of apocalypse inherent in the cybernetic representations of nature laid the foundations for requiring international cooperation in the mission of securing collective security threatened by the potential collapse of ecosystems: cooperative security based upon recognised interdependence and commitment to joint survival.

Conclusion

This is the starting point for the argument running through the rest of the thesis—recognition that a normative, orthodox discourse of modernisation shapes the way we conventionally conceive the nature and practices of international environmental policy. This is discourse not only in the sense that Hajer (1995 p. 44) used it, a configuration of ideas and categories through which meaning is given to

phenomena, but discourse as a modernist regime of knowledge and disciplinary power *sensu* Foucault (distinctions discussed in Gasper and Apthorpe 1996 p. 2-4). It represents a system of power relations producing domains of objects and rituals of truth (Gasper and Apthorpe 1996 p. 4). In this discourse, international environmental policy is portrayed as a cooperative, politically-neutral venture that employs scientific and technical means to address global environmental problems. This socio-culturally produced perspective of western origin entails a particular relationship between, on one hand, developing countries and, on the other hand, developed countries and intergovernmental and nongovernmental organisations dominated by people from those developed countries. This relationship is based upon a belief in the West's technical and intellectual superiority. Experts play a central part in this discourse.

In thus describing, analysing and critiquing the discourse of global environmental policy, I have established the basis for an external critique of modernisation theory, in the sense in which Banuri used this term—a critique that rejects the theory's suitability as a strategy for the future of Third World societies by calling into question the supposedly universal benevolence of western environmental policies. In the next chapter I begin such a critique by constructing an alternative reading from perspectives found in social science literature.

Chapter Three

Power and Interests: an Alternative Reading of International Environmental Policy

Introduction

This chapter starts to 'denaturalise' the field of international environmental policy by looking for counter-readings in the social science literature. It begins by examining the limited concepts of hegemony associated with these policy processes, raising the question of how the highly normative, orthodox expression of modernisation theory that forms the dominant discourse in this field may be hindering its recognition. The chapter then examines the conception of actors found in the discourse and ideas about why those actors cooperate, discussing how these understandings may also be restricted by the dominant discourse. Table 5 at the end of the chapter summarises these insights, comparing them with orthodox perspectives in the previous chapter.

Hegemony in International Environmental Policy

CRITIQUES WHICH IDENTIFY HEGEMONY

In the social science literature, there are two broad suggestions about how hegemony might be operating in international environmental policy; both view hegemony as undesirable. One sees the centralised technocratic management (described in the last chapter) as eco-fascist, an eco-imperialist effort to establish a world order, which environmentalists often inadvertently support in their zeal to monitor and encourage managerial responses to crises (Dalby 1998 p. 312-313). The other sees hegemony as derived from capitalism in its modern neoliberal form of governance, the latest insidious chapter of the larger post-war history of the expansion of western reason and economic thought (Watts 1999 p. 89). In these critiques, accusations of imperialism, eco-fascism, and neoliberal hegemony are often intertwined. So too are environmental and development issues, which is not unexpected, given views such as those of the South Centre (2002), which contends that the global environmental agenda

cannot be separated from the conflict between Northern industrial nations and Southern developing countries because social conflict is part of the environmental problematique.

This section fleshes out various notions from social science literature that bear upon the idea that international environmental policy may be hegemonic in character. As well as charges of eco-fascism and eco-imperialism, it examines interpretations of neoliberalism and of capacity-building as hegemony, and various practices of hegemonic cultural modernisation such as rational planning for environmental problem-solving.

Critiques of neoliberalism

Most of these accounts of hegemony position North against South, regarding the hegemony of the North as undesirable. Taylor and Buttel (1992 p. 406), for instance, argued that global constructs of environmental issues involve a universalising discourse that steers us away from the difficult politics of enduring structural inequalities and differentiated interests, towards techno-managerialist remedies, preferred and constituted by Northern-based scientists and bureaucrats. Activist Vandana Shiva has argued that the global creates the moral base for green imperialism against the poor in countries like India (Jamison 1996 p. 236). Moreover, according to Görg and Brand (2000 p. 372), amongst developing countries there is a general perception that western beliefs continue to prevail in environmental regimes, reflecting rather than redefining the international distribution of power.

Critics of neoliberal global environmental governance, found mostly in the disciplines of geography and political economy, see hegemony as embedded in the neoliberal global political economy. They posit too cosy an arrangement between international environmental policy initiatives and the neoliberal interests, Northern neoliberal states and big business, as expressed through agencies such as the World Bank and GEF (Escobar 1995; Goldman 2001). This is hegemony in a neo-Gramscian sense, dominant power relations being maintained by consent as well as coercion (Ford 2003 p. 120-121). As Peck and Tickell (2002) observed, the hegemony of neoliberalism is most evident in the ways in which profoundly political and ideological projects have successfully masqueraded as a set of objective, natural, and technocratic truisms. There are, however, few detailed studies of how neoliberalist policies aimed at solving environmental problems impose hegemony on developing countries. In one such study, Goldman (2001) described how the World Bank has fostered a 'newly emerging art of government' in Laos, introducing science, regulation and capital investment within the frame of a global environmental scientific discourse. Opening up access to the Mekong, the Bank's efforts are constructing an 'environmental[ly responsible] state' and making it accountable to the global community through a politicised ethics. Goldman judged the forms of rationality and science that the Bank was institutionalising, particularly its brand of assessment, as hegemonic: in the push to construct 'universals', alternative (unspecified) knowledge was being submerged, co-opted, or deemed illegitimate.

> In the case of resource-rich and capital-poor borrowing countries such as Laos, natural wealth and natural-social relations are being transformed through proliferating scientific and political processes under the mantle of *environmentally sustainable development*. Based on actual practices however, it should be renamed *green neoliberalism*, a political rationality that has fostered the scientization, governmentalisation, and capitalisation of some very hotly contested eco-zones (e.g. the Mekong, the Amazon) (Goldman 2004 p. 536, emphasis in the original).

Goldman also describes the subjugation of the knowledge of 'non-experts', the 'millions of people perceived and the object of study and of development', who become legible and accountable only within the context of a specific capital investment and culture of development capital, and only as objects for interrogation and betterment (Goldman 2004 p. 68).

> Surveys typically construct and then characterise populations based on very simple (but enduring) social categories, classifying people as fisher, hunter or swidden cultivator when many people can be all or none at different times of the year. Some studies define 'downstream' as being just a few miles away from the dam or project and hence make invisible the ecological and social 'downstream' of large projects, which can include hundreds of miles and whole groups of people (ibid).

A different example of how neoliberalist policies aimed at solving environmental problems impose hegemony on developing countries comes from Africa (e.g. Tanzania and Kenya), where the economic reforms of the IMF have emphasised wildlife tourism as the cornerstone of economic development. Those reforms have given private investors considerable control over both the tourist industry and protected areas. Historically, the establishment of parks and preserves in southern Africa created new categories of criminal activity, outlawing entire livelihood systems practiced by local groups (Neumann 1995). In the 1990s, when neoliberal reforms emphasised the wealth creation potential of protected areas, those managing the reserves sought to increase their effectiveness, by enlarging them, annexing adjoining land to create buffer areas, and linking areas through wildlife corridors. In doing so, those managers identified a whole new suite of technically defined management issues and a new classes of perpetrators, labelling subsistence and petty commodity production activities as 'poaching', and instituting a crackdown on those practising them (Neumann 1995; Schroeder 1999). This form of neoliberalism uses biodiversity protection as a new regime of accumulation, reinvigorating coercive tendencies that have long been part of much western conservation (described in Peluso 1993, for instance). In accounts of this phenomenon, the hegemons are seen as an international alliance of state agents and wildlife managers, including major conservation NGOs such as WWF (Schroeder 1999).

Critiques of the neoliberal form of global environmental governance, which position North against South, are similar to, and sometimes overlap, the alternative perspective of development labelled as post-development. Post-development perceives development as threatening diversity, homogenising local traditions through the apparatus of state (investment, measurement and planning), and eclipsing the local through general conceptual categories and western assumptions. For instance, Sachs (1992 p. 33-36) railed against a 'global ecocracy' with 'survival as its *raison d-être'*, which reduces ecology to a set of managerial strategies for resource efficiency and risk management. With its broad philosophic sympathies towards post-structuralism, post-development resists the West's universalising discourses including neoliberal and Marxist meta-narratives of development (as described in Watts 1999 p. 89).

The work of Arturo Escobar (1995) links post-development thinking with environmentalism. Escobar's critique is staunchly anti-modernist, decrying modernisation and 'development' as intrinsically unjust projects concocted after World War II by entrenched global trade and financial institutions (Flitner and Heins 2002 p. 320). Escobar is, in effect, questioning whether the construction of modernisation theory and its positioning as a dominant paradigm, is the result of hegemonic influences in a socially constructed international system. Escobar's critique of modernisation is an external one *sensu* Banuri, questioning its moral basis and rejecting its suitability as the future for Third World societies. In contrast, neoliberal policy responses to environmental degradation are the products of an internal critique of modernisation theory, strengthening the theory (Banuri 1990 p. 57-58).

Foucauldian insights leading to charges of eco-fascism and eco-imperialism

Goldman and Escobar are two critics using Foucauldian perspectives to challenge contemporary western notions of appropriate environmental governance. Another is Timothy Luke. In warning of the moral anarchism of ecological crusaders, Luke judged both deep ecology and sustainable development to be hegemonic. Luke (1994 p. 160) postulated that eco-philosophies and supposedly wholesome moral technologies may be co-opted in the pursuit of political power and maintenance of an advantageous political order. He criticised the prevalence of 'green hustlers', misguided opportunists who have become intent on making the world 'a better place to live' in order to get themselves political power (Luke 1993 p. 141). "Believing that they must do anything and everything to protect Nature, they transform environmental protection into a moral crusade... the ecological crisis becomes the hunting grounds of eco-opportunists, hustling Nature in search of power" (ibid). Examining deep ecology, Luke portrayed it as a Foucauldian strategy of power for normalising new ecological subjects, both human and non-human, warning that it "provides the essential discursive grid for a few enthusiastic ecosophical [eco-philosophical] mandarins to interpret nature and impose its ecological dictates on the unwilling many" (Luke 1988 p. 85).

These critics judge various organisations as eco-fascist—particularly intergovernmental organisations (IGOs) with a high profile in environmental policy matters. Some of these agencies under the UN umbrella, the World Bank and the GEF in particular, are also the villains in of neoliberalist critiques. As discussed in the previous chapter, they have been charged with environmental managerialism—blueprint approaches to environmental problems, requiring technological and resource transfers (Redclift 1994; Adger *et al.* 2001 p. 701-705).

Since the late 1960s, the UN has been attempting to extend its system of international environmental governance to include all countries. Those attempts include the summit conferences at Stockholm (1972), Rio de Janiero (1992) and Johannesburg (2002); the founding of UNEP and the extension of the agenda of other UN agencies to include environmental issues (not only the World Bank but agencies such as UNDP and the Economic and Social Commission for Asia and the Pacific (ESCAP)); and, last but not least, the inclusion of environmental issues on the agenda of the Global Conference on the Sustainable Development of Small Island Developing States (GCSDSIDS) at Barbados in 1994 and the 2005 follow-up at Mauritius (BPoA+10). There are some similarities between these UN efforts and historical efforts in western Europe to extend urban power over the countryside and increase control of

the non-urban space (the more 'natural' environment) and the population living in that territory, in order to guarantee state 'security'. Foucault analysed those efforts, seeing the domestication of nature as part of a system of power relations among humans which had the objective of maintaining a given social order (Darier 1999 p. 23-24). There is a parallel in UN's attempts to extend, under the guise of environmental policy, the system of social control in developed countries to include those in developing ones. The UN efforts' echo earlier European history, albeit on a grander scale.

This suggests that, as potential hegemonic sites, IGOs merit careful, detailed analysis, as do civil society groups operating internationally. As Ford (2003 p. 123) observed, the groups regarded as constituting global civil society comprise a "fairly exclusive club, which cuts the grassroots off".

Neo-Gramscian insights into civil society organisations

Ford (2003 p. 123) suggested that global civil society may be a site for maintaining as well as challenging hegemony—entrenching and legitimating hegemonic global environmental governance, rather than challenging it. Seen from a neo-Gramscian perspective, global civil society is a discursive space that reproduces global hegemony, legitimising hegemonic global environmental governance (Ford 2003 p. 129). "The more institutionalised NGOs that are actively engaging with global environmental governance, work largely within the framework of technical-rational knowledge thereby arguably contributing unintentionally to the reproduction of orthodox global environmental governance" (Ford 2003 p. 125). Lal (2000) describes large international environmental NGOs as eco-imperialists forging new sources of moral authority outside the nation-state. He charges them with being on a modern-day secular Christian crusade of saving Spaceship Earth, which prevents economic development in poor countries such as India. Lal identified the culprits as 'Greens' organised into NGOs, acting as the 'self-proclaimed voice of an international civil society', and pushing their agenda through various transnational organisations like UNEP, the World Bank and World Health Organisation (Lal 2000).

These general criticisms provide good reasons for exploring whether the policies and practices of international conservation organisations are hegemonic. Conservation is not just an end, as defined in the IUCN/UNEP/WWF *World Conservation Strategy*: "the maintenance of essential ecological processes and life-support systems, the preservation of genetic diversity, and the sustainable utilisation of species and ecosystems" (IUCN *et al.* 1991). It is also an intervention, a social and political process by which natural resources are managed to maintain biodiversity (Alcorn 1995 p. 15).

The increasing professionalisation of environmental NGOs, which Jamison (2001) has described, may be contributing to hegemony in developing countries where these organisations work. Large environmental NGOs have commercialised and privatised concern for protecting the environment; many are more like business firms than social movements (Jamison 2001 p. 144, 175). International conservation is expensive and for organisations like WWF to survive they need to be able to see where the funding for their work is coming. The combination of funding structures needed for these large-scale interventions and the managerial tools of these large-scale and top-down initiatives inevitably privilege 'big conservation' (transnational conservation organisations) at the expense of grassroots or even national conservation organisation (Brosius and Russell 2003). Wolmer (2003 p. 4) suggested that

the massive funds necessary for large-scale conservation initiatives are leading conservation organisations like WWF to develop funding strategies in conjunction with multilateral development banks and building corporate linkages, causing them to become more business-like. But this can be read as the reverse: WWF and other major conservation NGOs decided to become more business-like then searched for suitable tools to achieve this. This is an intentional strategy. WWF is using the tools of the corporate world to repackage conservation as an investment opportunity for corporate bodies. The organisation is also attempting to cement its authority on matters of global environmental governance.

One of the few researchers investigating the efforts of major conservation NGOs to consolidate their authority over global conservation practices is anthropologist Peter Brosius (e.g. Brosius 2004; Brosius forthcoming). Brosius's criticism parallels Escobar's critique of modernity, except that it is specifically directed at conservation groups using tools formerly monopolised by the state. Those organisations have, Brosius argues, incorporated into the managerial apparatus of conservation, tools and approaches—Brosius calls them 'administrative technologies'—that originated as emancipatory moves (Brosius 2004 p. 16). The text box below summarises Brosius's critique of one such practice, ecoregion planning, a practice I explore in some detail in Chapter Eleven.

BROSIUS'S CRITICISM OF ECOREGION CONSERVATION

Since the late 1990s, several major conservation organisations, including WWF and The Nature Conservancy (TNC), have scaled up previously local conservation projects to cover entire regions, using map-based land-use planning and prioritisation approaches under the rubric of ecoregion conservation planning. Brosius charges that, by linking these exercises to another invention 'conservation finance', and reframing the conservation enterprise in the neoliberal terms of an investment portfolio, those NGOs have made local people accountable to the foreign donors of conservation dollars (Brosius 2004 p. 16-17). In developing proprietary databases, maps and lists of 'significant areas', they have created new centres of calculation *sensu* Latour (1987), essential for acting at a distant upon unfamiliar places, people and events. In establishing their expertise with such technologies, they get taken for granted as methodological gatekeepers. 'Increasingly conservation has become a gated community that one can enter only by accepting the methodological terms promulgated by major conservation organisations' (Brosius 2004 p. 16).

Notions of hegemony in international environmental policy: a summary

To recap, there is some evidence of hegemony in international environmental policy. Various Third World political ecology and environmental anthropology studies describe physical displacement occurring in the name of international conservation and forest protection (e.g. Ghimire 1994; Nygren 2001). This can limit opportunities for local economic development by preventing local access to land

and resources. The process of modernisation may also, through neoliberal schemes, set up new regimes of accumulation that benefit (either existing or new) élite. In specifying the course of development that should be followed—or which should not be because of its environmental effects—efforts at globalising environmental and conservation policy may change the distribution of costs and benefits without explicitly acknowledging that change. They are thus hegemonic in their silences.

Accounts of such domination and hegemony in international environmental policy are, however, short on detail about what else of the local is being displaced or eclipsed. Furthermore, international environmental policy, when transferred to developing countries, seems to entail a faceless hegemony—it is difficult to pin down who benefits from its policy practices. This is perhaps because these practices constitute a form of cultural hegemony, eclipsing the local, its knowledge, culture, traditions. This phenomenon occurs when one or more group dominating others to the extent that cultural perspectives are skewed in favour of the dominant group; as a result, other cultural beliefs, values and practices become submerged and partially excluded (Wikipedia c.2004). At whatever site a dominant culture emerges, the naturalisation and routinisation of its values and practices provide the ground for the unequal deployment of power (Johnston *et al.* 2000 p. 333).

Efforts to modernise the Third World by institutionalising rational planning practices and better (western) science through the medium of international environmental and conservation projects may be exerting cultural hegemony. So, too, might a problem-solving orientation to Nature, in societies where humans are regarded as part, rather than set apart from nature (for the Fijian view on this, see Chapter Nine). This is Escobar's critique expressed in the semantics of cultural politics. Sachs recognised this source of cultural hegemony when he labelled the contemporary modernist commitment to rationality, centralised control and planning as 'global ecocracy'. That commitment can be seen in efforts to institutionalise the use of problem-solving tools such as rational planning techniques, state environmental strategies, environmental management plans and ecoregion planning in developing countries. These planning exercises reflect a faith that borrows the legitimacy of science and technology yet is unscientifically optimistic about the possibilities for comprehensive planning and intervention to save the environment and allow human progress on a global scale (Scott 1998). This is a manifestation of contemporary 'high modernity', in which the expert and the professional have considerable status (as Simon 1998 p. 227 described). But, once again, these accounts of Third World modernisation as cultural hegemony are generally short on empirical details, restricted perhaps by the limitations that the orthodox interpretation of the global environmental policy discourse places on our ability to comprehend hegemony.

Yet, the similarity between the discourse of global environmental policy and that of globalism (discussed in the previous chapter), suggests that the discourse of global environmental policy may be hegemonic in the way that it legitimates globalism and sees development in the 'developing world' as following the superior path pursued by the 'developed world', an inevitable rather than a chosen path which is ultimately beneficial for all. Marcuse (2004) identifies globalism as a hegemonic concept by forming an analogy with Edward Said's analysis of Orientalism (Said had showed how Orientalism, elaborated in academic writings and popular discourse, achieved virtually hegemonic status).

"Globalism is to really[-]existing globalisation as Orientalism is to colonialism. Globalism is the hegemonic metaphor through which the actual process of globalisation is seen/presented" (Marcuse 2004 p. 810). This is particularly pertinent when one considers the central role that capacity-building and lesson-drawing play in contemporary international environmental policy endeavours.

READING CAPACITY-BUILDING AS HEGEMONY

In international environmental matters, capacity-building and lesson-drawing can potentially be read as hegemony, but rarely are. To critics of the philosophical basis of modernisation and development, capacity-building and lesson-drawing are problematic concepts because of the assumptions upon which they rest. They assume that western countries have superior technical skills and intellectual capacity in matters of governance and policy, and that people from developed countries are therefore morally justified in helping those with inferior skills and capacity. It is this belief in the superiority of Western achievements, institutions and values, a deeply-embedded belief in Occidental superiority over the non-West, that cultural critiques of modernisation rail against (Banuri 1990 p. 59; Slater 1999 p. 77).

The storyline underlying capacity building, along with its material practices of development aid, predisposes people of developing countries to cooperate in donor-funded projects, engendering cooperation across national boundaries. It does so by depicting those people as incapable of managing their environment, at the same time legitimating the authority of those funding and delivering capacity-building to teach them how to do so. There are overtones of environmental imperialism in the way the capacity-building discourse portrays the environment as a series of problem then assigns the blame for those problems to developing countries. Several commentators (e.g. Grove 1993) have described a 'first wave of environmental imperialism' associated with colonialism—imperialism that arose from the Enlightenment doctrine of continuous progress and the idea that the resource base of European countries needed to be expanded and unruly marginal subjects controlled. Capacity building appears to be a post-colonial form of environmental imperialism. Experts from developed countries are specifying what less developed countries must do to save their environment of behalf of humankind—ie on behalf of those living in industrialised countries which historically decimated their own biodiversity. In spelling this out, they are also specifying what course development should not take (the need to avoid pollution, loss of biodiversity etcetera).

Postcolonial environmental imperialism is not the coercive agenda of development-oriented state and allied organisations jeopardising the interest of local people in the name of environmental conservation (e.g. as described in Peluso 1993, mentioned above). It is, instead, a form of imperialism being presented in a cooperative guise—perhaps a form of neo-Gramscian hegemony, in which the leaders and officials of developing countries willingly participate. For the notion of capacity-building rests, in large part, on the idea that development is a right that must fulfilled equitably, expressed in the Rio Declaration: "The right to development must be fulfilled" (Kiss 1994 p. 62). The Rio Declaration expresses not the just right to, but the need for, development. This is incorporated into Principle 5 concerning the eradication of poverty, principle 6 which claims special priority to the needs of developing countries, and into Principle 9 concerning strengthening endogenous capacity-building for sustainable development by improving scientific understanding (Kiss 1994 p. 62).

Yet, the political agenda behind capacity-building reflects more than developing countries' search for equitable development. According to The South Centre (2002), the notion of capacity-building is part of a plot by powerful players in the North to weaken, challenge and roll back the multilateral conceptual/policy framework agreed during the Stockholm conference on the human environment, a framework that accorded a central and decisive role to intergovernmental action. That framework, which The South Centre contends underpinned three decades of North-South understanding on environment and development, was worked out at a time "when the underlying paradigm of international cooperation drew its strength from such notions as solidarity, differentiated responsibilities, special and preferential treatment for the countries lagging in their development process, and the need to shape the political and economic environment through government and intergovernmental action in order to attain set goals" (The South Centre 2002 p. 5). The Centre contends that, in the rising tide of neoliberal globalisation, powerful players in the North are now demanding developing countries improve their domestic governance and draw, not on multilateral assistance from formal intergovernmental agencies and the secretariats of international environmental regimes, but on the technical assistance (capacity-building) of private businesses and transnational corporations from the North (The South Centre 2002 p. 9). WSSD established close to 300 such partnerships between governments, industry and NGOs, in the pursuit of sustainable development (Wapner 2003 p. 3). This focus on technical assistance recreates a political issue as a technical one.

This is one of the ways on which Third Worldism has been subsumed into modernisation theory, as discussed in Chapter Two. In capacity-building, the technical language, the dichotomy of developed/ developing country, and the stylised North-South imagery all serve to disguise its political basis. The stylised dichotomy ignores the billions who live, work, and consume in ways that fit neither the extremes of overconsumption or poverty-induced ecological marginalisation (Conca 2003). Use of these dichotomous terms disguises social divisions such as gender, class, race and age, and in doing so, may serve certain political agendas, not only at the end providing assistance but also at the end taking it – that way that political and economic élite in the South use the capacity-building discourse to feed their lifestyle and consumption for example, something discussed in Turnbull 2004, and something that the South Centre's general diatribe against the North does not mention).

Capacity-building efforts can be read as potentially hegemonic in two regards. First, the solutions that westerners are imposing on developing countries through capacity-building are biased towards attaining a contemporary western style of modern society. One of the likely results is that insufficient space is being created for alternative futures and policy approaches designed to reach that future, to emerge from Third World societies. This presumably was what Hajer (1995) meant when he argued that while using the image of the planet is instrumental in the formation of a political consensus on the need for comprehensive and centralised global action, it is also disempowering to more situated or indeed social understandings of environmental problems and its solutions. This is also Escobar's concern about the local being eclipsed, as well as Goldman's concern about the World Bank's environmental governmentality, summarised above. Second, contemporary efforts at globalising environmental and conservation policy are trying to put today's developing regions onto a different

(shorter) trajectory towards modernisation than that which industrialised countries followed, without explicitly acknowledging how this alters the distribution of costs and benefits.

There are, however, few interpretations of capacity-building as hegemony. The key matter to be resolved is the extent to which the desire to dominate, intimately rooted in discourses of presumed superiority, mission and negative essentialisations of the Other, is coalescing in capacity-building, creating hegemonic policy (cf. Slater 1999 p. 67). To what extent do capacity-building efforts merely reflect a problem-solving orientation, an occidental faith in humankind's capacity for planning and control, without any intentional exercise of subordinating power? I return to this question of intentionality at several points throughout the thesis, including the next chapter and Chapter Eight.

The Actors

THE DIVERSITY OF ACTORS

The orthodox discourse of global environmental policy lacks any conception of hegemony, thus precluding any study of this phenomenon. It further limits our understanding of these policy processes by representing cooperation as a norm that is beneficial for all (as I investigate later in the chapter). Additionally, the discourse suppresses knowledge of the range and diversity of actors participating in these policy processes, in ways I discuss below.

There are few detailed studies of those involved in such processes. Neither the full diversity of actors involved, their modes of interaction, nor the differentiation within large groups and organisations is well documented. Yet, as the situation in the Pacific Islands illustrates, there is a wide range of groups cooperating in international environmental endeavours; this is both a personal observation, and one derived by perusing the annual reports of the Pacific Regional Environment Programme (SPREP). Foreign groups working on environmental endeavours in the region include intergovernmental organisations, non-governmental ones, foundations and philanthropic bodies, scientific organisations, governments, development assistance agencies and private businesses. They collaborate in a wide variety of environmental ventures including projects, workshops, and training initiatives. These range widely, from collecting data on the state of the environment and making it available internationally (e.g. assessments and reports required under treaties), managing environmental information (e.g. through library systems and databases) and even constructing facilities for those purposes. The funders include multilateral development assistance agencies such as the GEF, the ADB and European Union; unilateral development assistance agencies; large international NGOs run as businesses (e.g. WWF); national NGOs from developed countries; and philanthropic foundations. The range of technical partners is enormous. The local groups involved may be government agencies, academic and research organisations, or NGOs, whether oriented to development, environment, conservation, science, fisheries, or education oriented.

Difficulty in recognising the diversity of actors involved in international environmental policy, and in differentiating amongst them, is partly due to the models of policy incorporated into the discourse of global environmental policy. The hierarchical model of international governance limits our understanding of the diversity of actors, assigning them to pre-selected categories, coloured by the

belief that intergovernmental forums convened by sovereign nation-states provide the official setting for international politics and policy-making. Its companion, the problem-solving model of policy, restricts our understanding of their roles. Conventional political science and policy science have promoted this view, both disciplines being involved in facilitating the stability of the political institutions of the western nation state during the post-WWII era, and thus the stability of global intergovernmental organisations (Hajer 2003 p. 177-178).

Yet, commentators on the field of International Relations now acknowledge that non-state actors (scientists, NGOs, international organisations and industries) have driven the proliferation of environmental treaties since 1972 and that NGOs carry out various functions within the UN system at both policy and operational levels (e.g. Wapner 1995; Morphet c.1996 p. 142; Jasanoff 1997; Litfin 1999; McCormick 1999; Vig and Axelrod 1999). Other commentators acknowledge how rapidly the nature of global environmental governance is changing. New cooperative governance arrangements are emerging, including privatised governance, corporate-NGO arrangements, formal collaborations between non-governmental and intergovernmental organisations and deterritoralised practices whereby business and social movements negotiate rules without territorial states to enforce them (Paterson *et al.* 2003 p. 6). There seems to be general agreement that this trend is best understood in terms of the emergent dominance of network forms of social organisation (Coleman and Perl 1999; Castells 2000; Paterson *et al.* 2003 p. 6).

The interface of science and policy

In understanding the diverse groups involved in international environmental policy, a particular difficulty arises at the interface of science and international environmental policy. Accounts of science in international environmental policy often distinguish policy decision-makers from researchers advising on policy and those interpreting science to help decision-makers (the latter often called knowledge brokers or info-brokers) (e.g. Litfin 1994; Hajer 1995). This distinction accords with the notion, discussed in Chapter Two, that the process of integrating science into policy is linear and progressive, starting with the identification of a problem and proceeding through scientific research and predictive modelling to reach policy solutions. This is a view entrenched in both policy and political science. It is, however, an interpretation based on a specific western political culture, particularly prominent in the US. Miller (2001a p. 480) describes this as being 'hyperdifferentiated' science and policy. His research into climate change policy shows that there is not necessarily such a clear distinction between science and policy in the arena of contemporary international environmental policy.

Until recently most research in the field of international policy viewed science and policy as separate regimes. Work on their interface concentrated on identifying what demarcates science from non-science, how scientists maintain the boundaries of their community against threats to its cognitive authority (e.g. fraud and pseudo-science), on boundary objects (e.g. patents), and boundary organisations (novel institutional forms such as the Intergovernmental Panel on Climate Change (IPCC) and the IBP, which mix science and politics) (Guston 2001). Since 2000, this field of research has moved towards describing, in an increasingly sophisticated way, the relationship between science,

politics, and global environmental policy (e.g. Miller 2001a; a case study in Chapter Three of Keeley and Scoones 2003; Mitchman and Frodeman 2004 p. 4; Shaw and Robinson 2004). Using the United Nations Framework Convention on Climate Change's Subsidiary Body for Scientific and Technological Advice (UNFCCC SBSTA) as an example, Miller (2001a p. 495) argued that the institutions, material artefacts and discourses that populate all three domains (science, politics, and policy) are hybrids, complex mixtures of facts and values. Moreover, new institutional forms in the field of international environmental policy (e.g. scientific assessments, expert advisory committees, research management agencies) rely upon amalgamations of social practice drawn from the worlds of both science and politics (Miller 2001a p. 483). They operate under different standards and procedures than some other scientific activities such as publishing in scientific journals (ibid). In these efforts to more accurately describe the social and institutional landscape and to construct alternative geographies, the notion of boundaries, relatively narrow lines differentiating neighbouring entities, no longer seems appropriate; it serves, instead, to undermine these efforts (Miller 2001a p. 497, note 4).

International science/policy organisations

Worldwide networks of scientists have been a feature of post-WWII internationalism; in many scientific fields, including marine science, physics, and economics, they have been an accepted part of the international landscape for forty or more years. The present meteorological network, for example, dates back to the 1950s (Miller 2001b). There is, however, little theory reflecting the changes being wrought by recent globalisation, or how the emerging dominance of network forms of organisation in international environmental governance has affected, and been affected by, these scientific networks. This raises questions for the study to address (in Part II in particular).

UN agencies working on science/policy issues (including environmental matters) generally concentrate on intergovernmental harmonisation, technical assistance and international coordination of scientific research. Rather than being the logical outcome of science's politically neutrality, these types of endeavour are, according to Miller (2001b), the result of a highly political set of circumstances dating back to the early post-WWII era when the first of these agencies was being established. Promoting the idea that technical organisations would not abridge states' sovereign rights, US foreign policymakers insisted that the priorities of sovereign states take precedence within these international institutions (Miller 2001b p. 208). Miller (2001b) describes how that insistence shaped the kinds of observational networks and institutional capabilities that the WMO, an early example of this type of organisation, could build. Moreover, according to Miller, (2001b p. 172-179), the notion that the production, validation, and use of scientific and technological knowledge and skills could contribute to international peace and a free, stable, and prosperous world order convinced US foreign policymakers to create such regimes in the post-war era, shaping their organisation and activities (Miller 2001b p. 209 quoting Burley). These policy-makers implicitly linked the pursuit of science to the success of a liberal world order (Miller 2001b p. 173). Although Miller's study concentrates on US rather than European influence, as he points out, by looking across a variety of regimes it is possible to detect consistent patterns in post-war political mobilisation of expertise that correspond broadly to ideas being articulated by American foreign policymakers (Miller 2001b p. 214-215, note 1).

According to Miller (2001b p. 209), many of the same ideas about science and technology continue to influence the beliefs that both International Relations scholars and influential US policy-makers hold about these international institutions. Thus, a discursive (policy) framework limits the directions that international science cooperation can take (Miller 2001b). This framework is as much political as technical despite its apolitical face, because these modes of interaction prescribe legitimate interactions between expert and political cooperation. "They provide not only the instrumental and symbolic basis for legimating particular kinds of scientific expertise, knowledge and activity but also the authority to use that science to support the maintenance of public order and social trust within particular political systems" (Miller 2001b p. 207).

Political commentators conventionally point out how doctrines recognising scientific reason and growth as timeless virtues with universal applicability—as liberalism does—promote widespread desire for international cooperation in matters of environmental science/policy (e.g. Scholte 2003). The converse also applies: widespread international cooperation in science and technology popularises certain (liberal) doctrines as explanations of the world.

This discussion of international science/policy organisations sets out another of this thesis's points of departure from the normative project dominating descriptive and analytical social science of environmental policy. Although international organisations charged with promoting international scientific cooperation may appear 'above' politics, they have, within their own history, set-up, norms, and practices, limits on their politics. Historically they have been limited to matters of peace, prosperity and the maintenance of social order, ie, to control and management of the environment for the purpose of modernisation, development, and peace. This has been a political act reflecting modernisation theory, modernisation being imagined as a global process spread through a liberal zone of peace and scientific cooperation (Blaney and Inayatullah 2002 p. 103).

UNDERSTANDING POLITICAL STANCES, INTERESTS AND MOTIVATIONS

Understanding science as politicised

Jasanoff, in an analysis of epistemic communities, observed that many academics, in supporting how scientists and interpreters of science take control of many areas of international environmental policy, are prepared to leave by the wayside virtually everything they know about the contingency and plurality of knowledge. They overlook the complexity of the interplay between knowledge and politics, and the immense efforts and shared political commitments required to hold together global networks of technical practices and beliefs (Jasanoff 1996 p. 186). This reflects the depth of faith in science advancing the cause of global environmental policy. There have, however, been few empirical studies of how, in international environmental matters, science is being used as a political tool. Those analyses have concentrated on ozone, global environmental change, biodiversity, biotechnology, and climate change (e.g. Litfin 1994; Shackley and Wynne 1995; Takacs 1996; McAfee 1999; Demeritt 2001b).

In modernity, science is regarded as objective and neutral—'value-neutral' (a concept whose utility I discussed in Chapter Two). The claim that, in matters of policy, science is politically neutral is now in doubt, partly due to constructionist studies of science such as Latour and Woolgar (1979), Latour

(1987) and others. These have showed how the scientific method, far from being a paradigm of non-local universality, is nothing more than a locally situated form of practice that is rooted in local social action (Sardar 2000 p. 41). Furthermore, feminist scholars have charged that that science is patriarchal and discriminates against half the world's population (women) (Sardar 2000 p. 48-51). Taylor (2003 p. 99) offers other insights into the politicisation of science, pointing out that scientists' social status, politics, and social locations determine their preferences for some kinds of social action and politics over others; this in turn can influence their scientific analyses, and the policy solutions they favour.

Some working in the field of cultural studies argue that 'science is politics by other means', insisting that scientific inquiry is profoundly shaped by ideological concerns, something being explored by some Third World political ecology researchers who have showed the idea of desertification in West Africa is not simply a false construction of nature but also an ideological one designed to conceal the 'true' situation behind a smokescreen of purportedly objective science (Fairhead and Leach 1995; Demeritt 2001a p. 26-27). Fairhead and Leach (1995) describe how social science has been complicit in producing a view of history as one of increasing tension from a harmonious past, and of a future in which the role of the outsider in the control of rural resources is imperative. They describe how, in producing this future imperative, colonial-era stereotypes are alive and well in the social sciences being applied to produce environmental policy for Africa (Fairhead and Leach 1995 p. 1031-1032).

Latour (2004) calls the way in which modernity depicts science—not as 'politics by other means' but as neutral—as being a division of work that distributes functions between the sciences and politics. In Latour's view, the very invention of this absolute difference between science and politics was a political act (Latour 2004 p. 253 in note 9).

Although now, with the help of these commentators, we have the philosophical understanding to recognise science as political and locally contingent, and the commitment to the political neutrality of science as being ideological, we still need to apply those perspectives in analysing international environmental policy processes to address questions such as: What role are scientists playing in identifying and constructing global environmental problems and what particular policy solutions do they seek? Do the expert policy technologies designed by scientists represent strategies expressing the interests of the élite power of professionals? The question of who benefits from science's construction of environmental problems is also important for any study of the potential for domination in international policy. Furthermore, if we see the policy process not as a venture in cooperative problem solving but as an inherently political process, then does identification of global environmental problems always precede policy solutions being proffered in international policy processes, or are some (politically advantageous) solutions pre-chosen? Foucault's notion of the expert production of discourse offers one way of investigating these questions, as I discuss in Chapter Four.

NGO politics

A review of the literature on NGOs, particularly those involved in international conservation, suggests other questions. International conservation has become a business for non-governmental organisations, large and small. Large environmental NGOs, with their global presence, draw considerable funding from developed countries and operate extensive international networks. The growth of global

communications networks has enabled them to expand rapidly their sphere of influence, the Internet making it easy to run international campaigns based around sophisticated websites as well as glossy publications (Sutherland 2000). Although some older NGOs such as WWF have always had an international focus, the greening of international aid since the 1970s has contributed to this internationalisation (a phenomenon discussed in the previous chapter). Since the late 1980s, NGO programmes around the world have incorporated neoliberal, market-based programmes in order to gain access to development funds which became available when development institutions, supposing NGOs to be more efficient at delivering aid, started bypassing the state and partnering civil society organisations in developing regions (Levine 2002; Townsend *et al.* 2003). This trend had provided the opportunity for many NGOs to become international players, and for people to establish new ones.

We tend to clump most non-state actors (those not obviously industries or formally constituted intergovernmental agencies) into a single sector labelled as 'non-governmental', 'global civil society' or as constituting 'world civic politics' (e.g. Gordenker and Weiss 1995). Although there has been little critical examination of international NGOs with lesser profiles than WWF and Greenpeace, it is clear that not all international environmental NGOs employ the same methods of tackling environmental issues (Wapner 1995 p. 337-338; Jasanoff 1997 p. 590). We need to know more about the characteristics of groups subsumed under the 'environmental NGO' title.

Furthermore, in the field of international environmental policy, not only the politics of science needs investigating but also the politics of NGOs. There is little detailed knowledge of the internal workings of environmental NGOs working in the international sphere—of the internal processes of sites from which ideas emerge and are diffused, or the cognitive and institutional channels through which environmental problems reach international policy agendas (Jamison 1996 p. 238). There has been little attempt to grasp or even conceptualise either the role that non-governmental groups and movements have in shaping or constructing knowledge about the environment, environmental problems and solutions, or how they interact with accredited knowledge-producing institutions such as universities and scientific research organisations (Jamison 1996 p. 239). In addition, although large NGOs can be sites of contestation and struggle as Ford (2003) suggested for WWF, their internal processes of intellectual development and issue articulation, and their collective construction of social and natural reality, are rarely studied (Jamison 1996). Similar comments can be made about intergovernmental organisations.

With its sweeping generalisation, optimistic statements about their potential for delivering development and solving environmental problems, amongst other matters, and instrumental treatises on building the capacity of local NGOs for that purpose, the literature on NGOs obscures their political stances. This literature idealises NGOs as disinterested a political participants in a field of otherwise implicated players (Fisher 1997 p. 441-442). This is not just a problem of ontology. Ford (2003) argued that in privileging the agency of states within an international system, seeing states as observable actors, and in conflating social movements with NGOs, contemporary epistemological structures obscure the role of certain actors and inhibit an understanding of agency.

In the sphere of international environmental policy, large professional NGOs are almost invariably equated with global civil society, which is usually described in liberal terms, as being fostered by the inter-state system and integrated world market (Ford 1999 p. 70). Wapner (1997), for instance, described global civil society as the domain that exists above the individual and below the state, and across state boundaries where people voluntarily organise themselves to pursue various aims. In this depiction, the 'top-down' structure demarcates the space for 'bottom-up' activity. This raises the question of whether liberalism is able to recognise radical movements that operate outside rather than within the intermediary space (Ford 1999 p. 70). Equally critically, does it on occasions mistakenly label as radical, that which is orthodox? Ford (1999 p. 125) warns that efforts to address environmental degradation—depicting environmental problems as capable of solution through technocratic approaches—should not be confused with radical social agency challenging the orthodoxy of global environmental governance. As she pointed out, many of the more institutionalised and active international environmental NGOs work within the framework of technical-rational knowledge, reproducing orthodox environmental governance rather than stimulating social change. According to Ford (1999), orthodox International Relations confounds this by conflating the notion of social movements challenging orthodoxy and hegemony in global environmental governance with NGOs.

The nature of the various groups involved in international environmental policy, and the role they have in shaping or constructing knowledge about the environment, environmental problems and solutions obviously needs empirical research (Jamison 1996; Fisher 1997; Brosius 2004). Which groups are key influences; how do they define appropriate policies; are they seeking to challenge or maintain the orthodox version of the global environmental policy discourse? What are their political interests?

Interests and motivations

The notion of political interests in environmental policy is neither well theorised nor much examined empirically. The usual interest identified in the environmental policy literature is the moral one: the set of sentiments and propositions that provides a 'unified moral vision' and runs in various guises throughout almost all ecological and green politics (Harvey 1999 p. 17). But this idea of a unified vision and moral agenda is problematic, as Harvey (1999 p. 18) illustrated by analysing a wide range of political values that underlie environmental-ecological opinion. He concluded that all ecological projects and arguments are simultaneously political-economic projects and arguments (and vice versa); ecological arguments are never socially neutral any more than socio-political arguments are ecologically neutral (Harvey 1999 p. 25). Moral arguments for certain environmental policies are therefore likely to cover political and economic interests—something that Jasanoff (1996) pointed out for groups of scientists involved in environmental policy.

The interests of those participating in international environmental policy endeavours should not be regarded as being only of an environmental nature, something political ecology acknowledges when it emphasises the difference between local interests and those of states, big business and foreign interests. These interests should be analysed as political, and possibly economic (at both an organisational and an individual level). Some types of economic interest are acknowledged as playing a significant role in environmental policy—disputes over ownership of natural resources; capitalist ventures based upon

nature such as ecotourism and biotechnology; questions of intellectual property rights, for instance (Bryant and Bailey 1997; McAfee 1999; Parry 2002). International climate change policy provides another example: the fossil fuel industry is paying for sceptical critiques of climate change science and claims of global warming claims in an attempt to influence US policies in their favour, (Demeritt 2001b p. 328; 2001a p. 34-35). The type of economic interests in environmental policy, is however, much broader than these examples suggest.

The professional nature of environmentalism brings in other economic interests. There is a livelihood to be gained from the business of international environmental policy, whether one works for a state, intergovernmental, nongovernmental organisation, or a scientific one—and therefore competition for funding as well as for professional standing. As in other fields of policy, interpersonal competition for reputation, power, status and consultancy fees may motivate some players from academia (Peet 2004 p. 18-19). In the USA, right-wing opponents of the Kyoto Protocol propound this type of argument, alleging the threat of climate change has been exaggerated by scientists with a financial stake in adopting an alarmist attitude about global warming (e.g., Boehmer-Christiansen 1994). Boehmer-Christiansen (1996) suggested members of the IPCC exaggerated claims about global warming because creating a sense of crisis was of professional advantage. This neo-conservative criticism aims to refute scientific theories of global warming. The political left also recognise professional interest as a motivation, arguing the dominant scientific approach serves the interests of technocratically-inspired 'environmental colonialism' (Demeritt 2001b).

In studying the evolution of scientific research in the modern era, some social scientists and historians (e.g. Latour 1987) have described the connections between the material culture of scientific research and scientists' access to and understandings of nature. In doing so, they have stressed how cognitive developments depend upon the successful mobilisation of social and material resources. Thus, groups of scientists working on international environmental issues have a professional interest in ensuring the material resources they need to work, are made available. This led Latour (1987) to describe scientists as resource accumulators, entrepreneurs enrolling heterogeneous allies in the construction of ever-widening networks of material flows and social influence. Miller (2001b p. 206), in his historical study of the international meteorological network, argued that the ability of scientists to create and shape the material cultures through which they produce knowledge depends upon their ability, as a group, to articulate connections between their work and the evolving clusters of norms and practices that govern the deployment of science in broader socio-political order. This applies to both scientists working in domestic settings and those working in international settings.

But it is not just scientific groups that have these economic interests. So, too, do conservation and environmental NGOs which tend to operate as businesses. Since organisational growth and survival are important to NGOs, they seek a niche in the business of knowledge production, something that distinguishes them yet keeps them attractive to their patrons and funders. Esteva and Prakash (1998 p. 22-23, 33-34) claim that large inter-governmental organisations and 'global thinkers' such as the World Bank have constructed crisis narratives in order to impose global solutions, and to justify themselves as

essential to global environmental management. This raises the question of how these economic interests are affecting the international policy agenda on various environmental issues.

Conservation NGOs, as well as scientific organisations involved in environmental policy, employ staff who produce environmental knowledge. These staff have professional interests. Jamison (2001 p. 163) described a new breed of political green expert, 'movement intellectuals' who, on an individual level, often think of themselves as part of a movement and yet express their opinions and offer their political suggestions more or less as professional experts, since they earn their living to a large extent by speaking and writing. These green experts may be in competition for funding and publishing contracts. This raises, as a potential motivation for individuals, becoming an expert and gaining access to resources and influence. Notwithstanding such insights, knowledge of the various interests of actors involved in international environmental policy is sketchy. So too are understandings of why they cooperate, collaborate, and form partnerships, despite professional competition.

Explanations of Why Cooperation Occurs

In international environmental policy matters, actors may work together, in the pursuit of professional advantage for instance—the emerging professional élite in developing countries may cooperate with overseas experts. Moreover, in the face of one or more players with significant power (hegemons), people may cooperate because it is easier than resisting, especially if the act of cooperation may be used to gain some benefit. But equally possibly they may compete or resist rather than cooperate. So what is it that prompts such cooperation? The suggestion, found in orthodox discourse, that actors work together in addressing global environmental problems in order to harmonise their interests, joining together to save the planet as a means of promoting common and collective security, is simplistic. It is also inadequate as an explanation for cooperation because it is a functional explanation, as are most such explanations derived from political science (described in the box on the next page). (Chapter Four, in its section on problematic terminology, addresses the semantic problems of finding a suitable term to describe the manner in which groups work together on policy issues even when they may have different interests or ends in mind.)

Thus, political theory generally serves to obfuscate why actors work together in the diverse circumstances of international environmental policy. Not only are most of the theoretical explanations for international cooperation found in mainstream political science and International Relations functional, none is comprehensive enough to cover the diversity of situations found in international policy settings. Yet, it is clear that groups operating in the international sphere of environmental policy do cooperate. The question is why. The epistemic communities literature is no help in understanding this. Commentators have tended to uncritically adopt Haas's (1993 p. 178-180) notion of epistemic communities shaping international policy responses through cooperation. In consequence, little is known about the nature of political commitments that bind epistemic communities concerned with international environmental policy, or how they bind people from both developed and developing countries. Furthermore, while fracture lines have been identified—Lahsen's (2004) study of Brazilian experiences of the climate change regime revealed a complex domain characterised by transnational

networks and cognitive convergence, yet with persistent divisions—these divisions are little studied. The next section canvases explanations from social theory, anthropology and development studies.

INTERNATIONAL POLICY COOPERATION: EXPLANATIONS FROM POLITICAL THEORY

Institutionalist perspectives offer a functional explanation, theorising that if international institutions are to be effective they must create networks around, and within states, to generate the means and incentives for effective cooperation among those states (Keohane *et al.* 1993 p. 23-24). Since these approaches value cooperation and knowledge sharing, they assume that environmental regimes are benevolent, voluntary and cooperative (Litfin 1994 p. 190). The constructivist view is another functional explanation. For constructivists, the institutions of global environmental governance are expressions of subjectively shared norms, ideas and knowledge that shape identity and interests (Finnemore and Sikkink 2001 p. 406). People cooperate when they share norms and ideas— the assumption being that since they share norms and ideas, they have similar interests. Haas's notion of epistemic communities is a constructivist explanation.

Lipschutz's and Rosenau's postinternationalism offers another functional explanation, suggesting that states and transnational networks of societal actors continue to coexist because there is sufficient reciprocal benefit from each other's presence (Litfin 1997 p. 176). Postinternationalism seeks to explain the recent emergence of global civil society as a response to states' declining ability to cope with problems— the 'leaking away of sovereignty' upward and downward. Social movements are seen as trying to work around the restrictions of nation-states by forging transnational lines of support (Keck and Sikkink 1998). The way many environmental issues (e.g. climate change) transcend political and territorial boundaries is considered to support this 'leaking upwards' of sovereignty.

In contrast to those functional explanations, realism has two explanations for cooperation manifested as a burgeoning number of international environmental agreements: one based on hegemony (see Chapter Four) and one on egoistic state interests. But realism's world model, in which the most effective actors are states and power is both the main interest of all states and their means for self-preservation, is a simplistic explanation for cooperation between bodies other than states. The explanation of international cooperation in Marxist-based regulation theory is also inadequate. Focusing on how the effects of capitalism are being contained, this acknowledges cooperative strategies that aim to valorise nature, especially where governments and transnational corporations have a common interest in enabling access to certain resources such as fish, timber, and minerals. Organisations may cooperate to protect themselves against crises and their after-effects, both on a material level (when the overexploitation and destruction of nature could be counterproductive) and on a socio-economic level (if social tensions threaten to get out of hand) (Görg and Brand 2000).

Explanations from social theory

The suggestion that people may cooperate because they are socialised into it is common in social theory. Furthermore, people may be socialised not just in accepting certain policy positions; they may even be socialised into actively cooperating in policy projects. Scientists, for example, may be socialised into particular epistemic viewpoints and paradigms: scientific information often rationalises or reinforces existing political conflicts, old cleavages simply being recloaked in new scientific garb and epistemic dissension downplayed (Litfin 1994 p. 186, 197).

The idea of socialisation occurs in various strands of social theories, also some political theory. For both functionalists and Marxists, there is a prevailing culture in which people learn through socialisation, accepting prevailing ideas (Jones 1993 p. 50-51). In political theory, the concept of individuals being socialised into policy paradigms is found in both historical institutionalism and constructivism for instance (Finnemore 1996; Blyth 1997 p. 230). The concept of socialisation through discourse is also found in Foucauldian post-structuralism—discourse socialises people into accepting certain positions. Accordingly, in creating ecological oppression or liberation, particular NGOs, state agencies or transnational companies may not be acting autonomously but within structures defined by environmental discourses (Hajer 1995; Forsyth 2003 p. 271-272). Foucauldian post-structuralist perspectives equate the concept of individuals being socialised into policy paradigms with the normalisation of individuals (McHoul and Grace 1998 p. 68, 72-73). Shore and Wright (1997) suggest that policies operate as 'political technologies' *sensu* Foucault, working to socialise or normalise ideas (see Keeley and Scoones 1999 p. 5 for a similar perspective). Luke (1995a; 1995b) applied Foucault's perspective to both deep ecology and sustainability, highlighting the normalising power of both.

Yet, social theory also accepts that individuals are rarely totally moulded by the culture of their society and that actors' reasons and intentions are central in the creation and recreation of social life (Abercrombie *et al.* 1994 p. 395; Layder 1994 p. 135 quoting Giddens). Individuals may negotiate and challenge the values and beliefs with which they are confronted, in a struggle to make sense of the situations in which they find themselves, to understand and interpret their own identity (Edgar and Sedgwick 1999 p. 363, describing the social interactionism perspective); Foucault also recognised that the processes of normalisation associated with disciplinary power do not necessarily produce conformity (McHoul and Grace 1998 p. 72). Although people may be socialised into accepting certain policy positions, or into cooperating in policy ventures, this does not imply that they never renegotiate or reinterpret those. Moreover, post-structuralism suggests that people are 'dispersed' over a range of multiple positions, discourses, and sites of struggle (Edgar and Sedgwick 1999 p. 302). They are part of a 'messy reality' of multiple identities (Peet and Watts 1993). Thus socialisation is not a sufficient explanation of why groups cooperate in matters of international environmental policy.

Explanations from anthropology and development studies

Examples from anthropology and development studies show that the practice of sharing or creating legitimacy, whether for oneself as an expert or for one's organisation, may also lead to international cooperation. In one of the few ethnographic studies of people in developing countries joining international policy networks, anthropologist Annelise Riles researched a group of Fijian bureaucrats

and activists preparing for and participating in the United Nations Fourth World Conference on Women, part of a network called Pacific Women's Information/Communication Network (PAWORNET). Riles (2000) showed how the participation in and existence of the network (which operated at national, Pacific regional and international level) became self-justifying, the network becoming more than the sum of its parts. The network was a formalisation of information flow and the dispersal of funds, for people to attend international meetings for instance (Riles 2000 p. 66-67). Exchanges of information between participants took on a different, more formal significance when conducted through the network than they would have had outside of it (Riles 2000 p. 66-67). By naming the network and engaging channels of communication, actors constituted it and legitimised it.

Formalising the network shaped the pattern of activity undertaken, which centred on dispersing funds and on preparing documents such as the intergovernmental *Pacific Platform for Action* (Riles 2000 p. 67). Riles was surprised to find that, during the course of their work, the negotiators she was studying failed to problematise that which "anthropologists describe under the rubric of global-local relations" (Riles 2000 p. 90). Instead they brought the local and global into view through aesthetic devices, a form of patterning that Riles likened to the layering of mats, woven from pandanus, on ceremonial Fijian occasions—each mat able to transmit information individually and collectively as layers are piled up. In constructing national and regional documents for the negotiations, the negotiators concentrated not on analytical rigour or political argument, but on pattern. "The work of producing properly patterned language was in the main a sorting exercise, in which language was cut, arranged or inserted to produce appropriate strings of words" and the right resonance—which included checking to see that phrases such as 'indigenous' appeared sufficient but not too many times (Riles 2000 p. 80). Riles added that concern with questions such as 'what it means to be female' and the possibilities for a utopian female project would seem utterly foreign to these document producers. "Rather, their interests would be in the document's production process, in its language and graphics, in its anticipated outcomes including future documents, and in of course in its funding sources" (Riles 2000 p. 17-18).

Although not explicitly addressing motivations for cooperation, Riles' observations concentrate on sociality, shared codes of legitimation, and a shared culture amongst professionals working on the same issues that did not extend to sharing information outside their group or to extending their organisational connections and involving others (Riles 2000 p. 48-52). The network was, in effect a 'closed system', the precise purpose of information exchange through the network rarely articulated by its members (Riles 2000 p. 50). In this sense, its activities were self-justifying. The network was also a mode of legitimation in the sense discussed here; by communicating with other NGOs, those involved shared not only their mutual identification as part of the network but also their codes of legitimacy.

This illustrates how groups may cooperate in international efforts to address environmental problems represented as being global, in order to construct their legitimacy or to share codes of legitimation. The question of how organisations construct their legitimacy in order to continue influencing international policy is suppressed in the orthodox perspective of policymaking rooted in scientific planning, bureaucratic rationality, and the positivist language of cause and effect. In Development Studies there is, however, a theory about western agencies constructing their legitimacy through NGO networks

linking people in developing regions with those in developed ones. Townsend *et al.* (2003 p. 96) noted how NGO staff in rich countries and poor, working closely together and sharing interests and objectives, have built a community with a common vocabulary and ways of working (cf text box, p. 52). Western-based NGOs have thus become a transmission channel for donor fashions, western concepts of development and for the new public management revolution with its performance indicators and auditing culture (Townsend *et al.* 2003). Expressed in the jargon of underdevelopment theory, they carry resources and authority from the core to the periphery, and information and legitimisation for donors' work from the periphery to the core (Tredt quoted in Townsend *et al.* 2003). Miller (2004 p. 83) was describing a similar phenomenon when he called technical assistance as 'a two-way street', citing the way international scientific data collection networks help relocalise global knowledge (he was referring, in particular, to meteorological networks).

Various IGOs or NGOs may distract attention from the lack of democracy in their organisations by using rational planning processes to construct their legitimacy in an international system of policymaking. In doing so, they encourage groups based in developing countries to cooperate with them, through the allure (and the illusion of) being able to control, and change at will, the future. Conservation NGOs and scientific organisations may claim legitimacy through the traditional modes—representation, the law, and moral claims to promote the public interests. They may also, as professional organisations, claim it through competence and expertise (Edwards 2002).

These examples, drawn from fields other than environmental policy, present a range of reasons why groups may work together in international environmental endeavours and suggest that cooperation and collaboration may not be equally beneficial for all parties. The way that various groups work cooperatively on international environmental policy matters therefore deserves careful empirical investigation, all the more so since this field of governance is believed to be changing rapidly, as discussed earlier. The following table summarises relevant questions on this and the other topics covered in this chapter. It also lists the subsequent chapters addressing each question.

Conclusion

This chapter has shown the various ways in which orthodoxy (described in Chapter Two) limits our understanding of international environmental policy processes: in restricting understandings of the diversity of actors, assigning them to certain categories and roles; in assuming a distinction between science and policy that probably does not exist in reality; in being virtually silent about why groups cooperate in these policy endeavours, and in failing to recognise hegemony. In doing so, it has highlighted several matters which a study of coral reef policy could usefully investigate, which Table Five lists. This chapter has also begun to sketch out a counter-reading of international environmental policy, drawing on various bodies of social science literature that describe instances and types of hegemony, and various interests and political motivations. In the next chapter I build on these alternative perspectives, and on the various bodies of social theory introduced in Chapter One, to develop a suitable theoretical position from which to investigate coral reef policy critically.

TABLE 5: QUESTIONS RAISED BY TAKING A CRITICAL PERSPECTIVE OF THE LITERATURE

Orthodox view (summarised in Chapter 2)	Current critical thinking (in this chapter)	Questions raised by this critical analysis	Addressed in Chapters:
The environment as a problem: how are problems constructed and globalised?			
International policy is a cooperative appropriate response to a looming global environmental crisis; problems are deemed to be global through scientific investigation and scientifically-based predictions	Problems are constructed or described in certain ways in order to favour certain actors and policy interventions. In globalising problems, science may be serving certain political agendas	How are coral reefs being constructed as a global problem requiring international intervention to solve? How are locales such as the Fiji Islands being drawn into global problem specifications?	8,11-13
What is the relationship between the identification of problems and the policy solutions proffered?			
A modernist commitment to problem-solving sees policy as the appropriate way to respond to problems; the rational model of policy perceives a linear relationship	Policies may, instead, be élite strategies or they may be ideologically based	Are problems concerning coral reefs identified and policy solutions proffered in a linear fashion, the first preceding the second?	11-13
Who do we understand the various actors to be and what do we understand heir interests to be?			
The players recognised in the model of governance as territory are states, IGOs, NGOs, scientists and businesses	People have multiple identities and allegiances; subjects dispersed over a range of multiple positions and discourses. They construct their legitimacy in various ways Organisations are contested sites yet the literature obscures the political stance of various groups, including NGOs The relationship between professionalisation and policy approaches is little studied	What groups are key influences on international coral reef policy? How do they create knowledge about the environment and environmental problems; how do they define appropriate policies? How do they construct their legitimacy? How do the images, stories, narratives and arguments they construct reflect self-interest? How is professionalisation of international environmental policy affecting policy?	5-13
Why do these actors work together cooperatively?			
The rational actor seeks to harmonise interests, promote collective security and save the planet (or coral reefs at the least).	There is a variety of critical perspectives on why actors cooperate ranging from the simplistic idea that they are socialised into it to the suggestion they seek to create legitimacy and justify themselves, their activities and their claims for support	What social dynamics are occurring within an outwardly cooperative framework; what contestation is occurring and what modes of power are being exercised?	10-13
What socio-political roles do science and scientists play in international environmental policy?			
Science has a universal character and there is widespread faith in its ability to identify environmental problems, account for them in a value-free way, and find solutions	Poor understanding of how science is being used to politicise policy and of the political commitments that assemble epistemic communities around many policy issues.	How, in policy processes centred on particular issues and ecosystems, are people are using expert knowledge and storylines of science as political resources?	6-13

Chapter Four

A Base from which to Re-politicise International Environmental Policy

Introduction

This chapter continues the process of re-politicising the field of international environmental policy, preparatory to the empirical analysis of coral reef policy. It first re-imagines Nature (coral reefs) then coral reef experts and, following that, re-conceptualises policy processes to enable these to be interrogated for evidence of hegemony. In these re-imaginations, several points of difficulty are encountered; I discuss how I address those, the theoretical tensions entailed, and points that remain unresolved.

Coral Reefs at the Interface of Science and Politics

THE REPRESENTATION OF CORAL REEFS IN SCIENCE/POLICY

Using a broad notion of the politics of nature, discussed in Chapter One, allows me to investigate how nature (at least that part of nature known as coral reefs) is politicised through science and conservation in such a way that it lends support to the ideology of modernisation. The first step in this re-politicisation *sensu* Latour is to describe how the notion of coral reefs found in science/policy is a representation produced through scientific practice.

Coral reefs—complex, multi-dimensional phenomena, found in varying configurations covering many square kilometres of coastal waters in geographically different regions—are real phenomena that require knowledge to describe. The following box explains how science defines a coral reef, outlining lack of agreement over a definition.

WHAT IS A CORAL REEF?

The *World Atlas of Coral Reefs* suggests that recognising a coral reef is simple:

> From land or from the air, reefs are usually clearly visible, marked by a complex patterning of bright colours. These arrays of blues, turquoises and greens delimit a diverse and complex physical structure coming close to the ocean surface. The shallowest points are frequently shown by the brilliant white of breaking surf, and may even briefly become dry land during the lowest tides. From underwater the complexity is still more clearly shown—reefs are typified by the presence of large stony corals growing in profusion and by an often bewildering array of species growing or moving among them (Spalding *et al.* 2001 p. 15).

Scientists tend to describe reefs not by their appearance from above the water, but by geological and biological attributes (Kleypas *et al.* 2001 p. 427). A common description sees coral reefs as 'massive shallow water limestone structures with a high coral diversity' (Veron 1986 p. 27). The reef itself is an *in situ* build-up of carbonate matter, consolidated and cemented. Resistant to waves, it provides topographical relief, and a foundation for a living framework of interlocking coral and algal colonies along with sessile organisms and fish (Kleypas *et al.* 2001 p. 427). Scientists also define coral reefs by their environmental requirements: they occur in warm seas, in well-lit locations; since corals need sunlight to live, they grow in shallow water where light can penetrate (Veron 1986 p. 55; Kleypas *et al.* 2001 p. 427). Some count deep water coral aggregations as reefs. Although these may be large, they are mostly non-reef building, living without sunlight in ocean depths (Veron 2000 p. 27; Spalding *et al.* 2001 p. 1). Although the degradation of some of deepwater, non-photosynthesising reefs in temperate areas has received international attention recently, I have limited this study to tropical and subtropical reefs.

Yet in science, there is no single, definitive explanation of what a coral reef is, and where one begins and ends. Hence, the question of whether or not coral reefs exist is not a trite one. Could not the phenomenon that scientists are seeking to describe actually be a set of diverse phenomena best called by other names? I have, however, assumed that coral reefs do exist, because in diving and snorkelling around, and flying over, several islands in the South Pacific I have seen natural features which seem to correspond to descriptions of coral reefs in the scientific literature. Collectively these images give me a visual picture of coral reefs according sufficiently with the subjects of various discourses about coral reef degradation for me to consider them to be the same natural feature.

Science's inability to know the full extent of the reality of coral reefs

Scientific survey, monitoring and experimentation can only ever reach an approximate knowledge of coral reefs. Elements of the biophysical remain to some degree inaccessible to science. When environmental problems are on the 'margins of observability', there tends to be more uncertainty and a potentially higher level of social constructedness (Jones 2002 p. 249). Corals reefs are certainly on these margins, as the following text box describes.

THE DIFFICULTIES OF OBSERVING CORAL REEFS

As land-dwelling, air-breathing creatures, we have limited ability to directly perceive coral reefs. In the early nineteenth century, the European travellers who helped amass details about the structure of reefs and the habits of corals—Beechey, Chamisso, Quoy and Gaimard, Darwin and others—largely obtained knowledge of reefs indirectly. They platched around the shallows, hung over the edges of small boats, dredged up specimens or caught them with hook and line, in nets, or on sticks coated with tallow. Darwin (1890 p. 63-8) measured water depths with a leadline, examined coral fragments cast ashore during storms, and studied uplifted fossil reefs.

Today, we use specialised equipment to aid our limited sight, mobility, and inability to breathe oxygen from water. We can observe the calmer parts of the upper reef zone if we use a mask to keep the salt water out of our eyes, and a snorkel to ease breathing. We can observe parts below free-diving depth, by using scuba gear—compressed air down to around 30 metres deep or mixed gases to 100 metres. But diving time is limited by the build-up of nitrogen in the blood. And not everyone has the capability of swimming or diving; the underwater observation of reefs is the domain of those who feel at home both in the water and with the equipment needed.

Also, plankton and particles in the water often restrict visibility, and perceptions of colour, distance and size are different to those noted on land. In clear water, the maximum range of vision for a diver or camera is about 60 metres. Although most parts of a reef have clear water, visibility close to urban areas and river mouths is usually less than 15 metres, often as little as seven (Kenchington 1990 p. 36). Furthermore, human locomotion is slower in water than on land; divers cover less territory in a certain time than a person walking on land. Researchers have developed methods to compensate for this, using manta board tows or underwater scooters to cover large areas.

We can see something of a reef, taste and feel the salt water, experience the buoyancy of our body, feel the wave energy when surfing the crest of a reef, and the seemingly-solid reef structure if we have the misfortune to strike it when boating or swimming. We can recognise dead corals, from hurricanes and bleaching for instance. Other phenomena are more difficult to recognise directly: the minuscule (the presence of disease organisms, the departure of zooxanthallae from corals (explained in Chapter Five)) the mobile (changes in density of fish species) and the hidden (cryptic species living under coral colonies or in crevices, including those that have nocturnal feeding patterns).

Psychology has provided an insight into how science informs human society about nature, and into our own ability to know nature through direct observation. Even when an objective reality of nature exists, that reality is not necessarily something that people can directly observe. Part of the reason for this is that certain natural features such as coral reefs are difficult for most people to observe, as discussed in the text box. Furthermore, the senses are not all that determine the perceptual experience that observers have in the act of seeing/ sensing. Two people may interpret the same visual data differently because an observer's perceptual experience depends on factors such as past experiences, knowledge, and expectations. Previous experience and learning also determine the operational definitions and language that are used to convey what is observed. Belief in certain scientific theories may also affect how people observing natural phenomena order their observations; so too may their religious beliefs and their concept of the relationship between themselves and nature. For these reasons, science can never know the full reality of coral reefs, it can only represent them to some approximate degree.

Although there is a biophysical reality for reefs, the full extent of this is unknowable to humans—we cannot through science (or any other method) know it fully. This is not a position of complete relativism (the belief that reality has absolutely no meaning apart from what is believed to be real by some groups of believers) because some aspects of nature and of coral reefs are obviously not socially constructed—those aspects we perceive through direct perception such as the physical shape of coral colonies and the salty, wet nature of their seawater environment (cf. Milton 1996 p. 54). We cannot change some aspects of our environment by constructing different truths and meanings of it; we cannot, for instance, will coral reefs out of the way just as the thin hull of our yacht is about to strike sharp, abrasive corals. Thus the representation of coral reefs used in science/policy is just that, a representation of a biophysical reality, the full extent of which is unknown and unknowable to humans.

The contingency of science in knowing nature

In understanding how scientific survey, monitoring and research contribute representations of coral reefs to policy processes, arguments in social science about the contingency of those processes are important. For example, Thomas Kuhn showed how the approach of 'normal science'—working on minute scientific problems within established theories, using standard scientific techniques and procedures of gathering, sorting, processing, and applying information, all subject to peer-review—controls both the boundaries of accepted work and its quality (Sardar 2000 p. 27, 30, 72). Kuhn pointed out how scientists are generally constrained in the kinds of experiments they perform, the questions they ask, and the problems they consider important. This is because they work within an established paradigm, a set of shared assumptions, beliefs, dogmas, conventions, and theories (Sardar 2000 p. 28-29). They also work with certain concepts of nature, such as systems ecology discussed in Chapter Two. As a result, they produce certain representations of nature.

This has led to some extreme arguments about the ability of science to produce true knowledge. For example, philosopher of science Paul Feyerabend, who linked progress in science to acts of irrationality in the same way that Kuhn did, considered science to be only one tradition and one view amongst many, refusing to privilege it as a form of activity capable of producing true knowledge

(Oldroyd 1986 [1989 reprint] p. 336-337; Feyerabend 1993 p. viii). Rather than disputing whether science can produce true knowledge, others studying science (in social studies of science, social constructionism, and cultural studies) have concentrated on showing how scientific practice constructs knowledge, revealing its ideological and value-laden character. These commentators have emphasised the contingency of scientific practices producing knowledge of nature.

Moreover, Latour (1987) points out that, as a discipline, science represents nature differently when it looks forward (to the future) and backwards (to the past). Science's backward glance shows nature confirming the results of science since, looking backwards, one can say that the conditions of truth were met because the hypotheses of science were true. In contrast, science's forward glance presents a very different picture in which the results that hold (e.g. under the conditions of replicated measurements or experiments) are called 'nature'. This tells us of the sheer contingency of the process in which science decides on the way things are (Feenberg 2003 p.78). Here, then, is a view contrary to scientific realism's suggestion that science is able to describe an objective reality for coral reefs, a truth that is value-neutral, based upon direct, impersonal, and, in that sense, objective observation of an independent reality. It supports the suggestion that the notion of coral reefs used in science/policy is a representation of reality. Chapters Six and Eight investigate these representations in some detail.

Yet, as Demeritt (2001) observed 'socially constructed' has become synonymous with artificial and untrue. Yet "[j]ust because our knowledge of something is socially constructed and contingent, this does not [necessarily] mean that it must be false or unworthy of belief" (Demeritt 2001 p. 32, text in square parentheses added to emphasise the contingency). Nor does the ideology and values embedded in science/policy's representation of nature automatically invalidate that policy. After all, policy allocates values, as Easton (1953 p. 130) discussed when he defined policy as a web of decisions and actions.

RE-IMAGINING CORAL REEF EXPERTS

Having recognised 'coral reefs' in science/policy as a representation, the next step in constructing a theoretical argument about policy is to re-imagine coral reef experts. In this I start with the syncretism of science and policy.

The syncretism of science and policy

When investigating the social arrangements and practices internal to organisations where science, politics and policy mix, I treat the relationship between science and politics in matters of international environmental policy as one of hybridisation. Work emerging in the philosophy of science studies (discussed in the previous chapter) acknowledges how scientific and policy rhetoric blend into one another; scientific papers about coral reefs contain recommendations for management, for example. Rather than trying to maintain an artificial distinction based on ideal-type concepts of science and policy, I accept this syncretism as a reality and concentrate on its technical practices and its rhetoric—analysing texts and practices that lead to certain constructions. I do not attempt to draw any hard-and-fast boundaries between this syncretic reality and some ideal-type field of practice known as scientific research.

This sets the scene for acknowledging coral reef experts who operate at the interface of science and policy: people labelled as scientists who are active in policy talk, in policy practices, in designing, refining and advocating certain policy technologies and management tools, as well as in the more 'traditional' activities of research and publishing scientific accounts of that work. For, as well as re-imagining coral reefs, I need to re-imagine the notion of coral reef experts found in scientific realism, in accounts of capacity building and in modernisation theory.

The expert in modernity

In Western social theories, the expert is someone who can aid modernisation (efficiency, innovation and growth), using its standard tools (science and instrumental reason) (Banuri 1990 p. 86). Modernisation theory sees the legitimate purpose of international science as being limited to matters of peace, prosperity and the maintenance of social order. This perspective, which is derived from the concepts of liberal democracy and neoliberal institutionalism, legitimates networks of experts, transnational epistemic communities, such as those centred on environmental issues described by Haas. As a result of this view of science's purpose, in matters of international environmental policy, expert cooperation carried out in accordance with the expectations of intergovernmental harmonisation, technical assistance and international coordination of scientific research is widely viewed as being beyond and above politics (Miller 2001).

Modernisation theory's whole thrust is towards increasing differentiation in socio-political systems, expanding the expert/lay public divide (Dunleavy and O'Leary 1987 p. 279). Its expert, an agent of modernity, relies on impersonal, universal and 'objective' knowledge and derives authority from the concept of abstract neutrality by referring to scientific truths and utilising cognitive or instrumental reasoning. This expert is a member of a profession, an institution that develops and provides scientific and rational solutions to social (and environmental) problems (Lo 2004). This notion of expertise implies a partitioning of knowledge; the legitimacy of the expert is derived from the belief that he/she has a claim to a superior understanding of certain phenomenon, social and/or environmental (Banuri 1990 p. 97). Thus we have the expert in fisheries management, the aquaculture expert who can culture large numbers of desired organisms, the development planner, and so forth. In recognising an expert as an authority 'on' something, we are announcing and confirming someone who may rightly expect to be believed on a particular topic or item (Barnes 1986 p. 185).

Environmental experts create élite ways of knowing about the environment and people's relationships to it, ways that generally cannot be used by those subject people themselves (ibid). In late modernity, this notion of specialised expertise has rendered ordinary people of industrialised countries incompetent in dealing with contemporary ecological and technological hazards (Beck 1992 p. 53-55). Indeed, the radical modernism of this period has produced ecopathology, which sees eco-symptoms breaking out everywhere in the mundane routines of contemporary society in industrialised countries—symptoms that need expert attention not just to treat but to recognise their significance (Myerson 2001 p. 50-51, 54). This is part of what anthropologists have called the citadel problem: prevailing modes of theorising about science, technology and medicine have displaced societal issues and concerns into expert and often expensive technical problems, thereby isolating participation and

discussion while transforming the stakes involved (Downey and Dumit 1997 p. 6). One effect of this is that science often appears as a culture of no culture, developed according to autonomous logics apart from society, researchers' deliberations free from cultural content (ibid). This reflects the diffusion model of knowledge: bright, well-trained people inside the academy create knowledge which then diffuses outside through mechanisms of education, popularisation, policy and the impacts of new technologies (ibid). This diffusion model of knowledge is similar to the diffusion (lesson-drawing) model of policy mentioned in Chapter Two; according to the latter, the learned diffuse policy to developing countries through capacity-building etcetera. The diffusion model of knowledge, like the diffusion model of international policy, accords with the theory of modernisation.

Extending the reading of 'the expert'

There is, however, a broader way of perceiving experts than that provided by modernisation theory and this acultural diffusion model. This broader conception relies upon seeing experts as people in certain fields of knowledge *sensu* Foucault, accorded a central status (a position of authority) by the factors that made possible the objects and concepts of that particular knowledge system in the first place. Analysing what those factors are reveals how certain people achieve 'expert' status.

In addition to the theorisation of modernisation, various other factors, outlined in Chapter Two, permitted international environmental policy to become such a knowledge system. One such factor was the rise of ecology as a tool in the race to save the planet; ecology has its own experts who thus gain a central place as experts in environmental policy processes. Moreover, the belief that scientific knowledge, if communicated, will lead to ecological sustainable societies, confers the authority of environmental policy expertise to those who communicate scientific knowledge—the experts that Litfin calls 'knowledge brokers' (1994 p. 4).

In the modern world, experts have a professional authority that is dependent upon a particular professional-laity relationship (Lo 2004). Post-colonial attitudes have created the particular professional-Third World laity relationship that underpins international policy matters concerned with developing countries. Those attitudes accord a central place to those who claim to be authorities in solving the environmental problems of developing countries. Thus we have experts in marrying conservation and development, for instance, who automatically become acknowledged as experts in international environmental policy.

This, then, is a much broader interpretation of the 'expert' in environmental policy matters than modernisation theory alone allows. An expert is someone placed in that position by a particular professional-Third World laity relationship entailed in post-colonial attitudes and/or by the rise of ecology. We can also see experts as hybrid creatures operating in the hybrid field of science/policy (including conservation science/policy) (Chapter Three). This repoliticises science/policy experts in much the same way as Latour (2004) wants to repoliticise science. In using Latour's view of science as a highly politicised field of endeavour as a point of departure for this study, I reject the idea that experts only purvey scientific truths based on reliable science and accurate statistics, or only seek rational and scientific solutions to social problems in a neutral and objective manner. Rather, I see them

as part of a political assembly around the notion of an ecological crisis, participating in policy endeavours in ways that require empirical investigation (cf. Latour and Weibel 2005).

Latour (1993) offers another insight into experts in modern society, writing of their 'invincibility'; his argument is dense and I only give an oversight here; later chapters illuminate it through empirical inquiry and Chapter 13 summarises those insights. "By separating the relations of political power from the relations of scientific reasoning while continuing to shore up power with reason and reason with power, the moderns have always had two irons in the fire. They have become invincible" (Latour 1993 p. 38). They have become so by making invisible the acts of mediation and translation and the networks by which claims are transformed into facts These acts (explained in the box below), Latour (1993 p. 37) calls "the unthinkable, the unconscious of the moderns" since they are rarely thought about or acknowledged. This invincibility, in Latour's view, derives from the dichotomy between nature and society which modern society has established, explained in the following text box.

Latour's Perspective on Modern Society

According to Latour (1993), in establishing a dichotomy between nature and society, we (intellectuals in modern society) employ two sets of practices. Latour calls the first, 'works of translation or mediation', the creation of hybrids, networks and 'collectives'. The second he calls 'the work of purification', the establishment and maintenance of the dichotomy between non-humans and nature on the one hand, and humans, culture, society and politics on the other. Latour makes the point that although, when we think about dichotomies explicitly, we tend to do so only in terms of the 'work of purification', we overlook how that set of practices depends on the other set. Each set of operations (translation and purification) depends on, rather than being an alternative to, the other. Without translation, hybridisation and mediation, 'the practices of purification would be fruitless or pointless'; without purification 'the work of translation would be slowed down, limited or even ruled out (Latour 1993 p. 11). Latour's model of the Constitution of modern thought (defining humans and non-humans, their properties and their relations, their abilities and their groupings) helps us understand the dynamics of oppositions like nature/society (also agency/structure) and how the problems with dichotomies derive from only perceiving part of the Constitution, rather than all of it (van Krieken 2002 p. 255). His Constitution of modern knowledge consists of three resultant 'guarantees': (1) even though we construct nature, nature is as if we did not construct it; (2) even though we did not construct society, society is as if we did construct it; and (3) nature and society must remain absolutely distinct; the work of purification must remain absolutely distinct from the work of mediation (Latour 1993 p. 32; van Krieken 2002 p. 264). Nature and society can thus alternate at will between being 'hard' and 'soft', one determining the other, or the reverse, to suit our needs at the time and place (Latour 1993 p. 32-26; van Krieken 2002 p. 264). This is what Latour's calls the 'invincibility of the moderns' (Latour calls those whose life is shaped by this constitution of modern, western society, 'the moderns').

Conceptualising, Interrogating and Re-politicising Policy

CONCEPTUALISING THE POLICY PROCESS ADEQUATELY FOR CRITICAL STUDY

Re-imagining international environmental policy as a socio-political process requires more than just re-imaging coral reefs and coral reef experts, however. This act of stepping outside the orthodox version of the discourse of global environmental policy requires a suitable model of the policy process, one that sees beyond the normative conception of international cooperation. Chapter One described how common model of international environmental policy processes has an instrumental view of both policy and the policy process. Its hierarchical view of policymaking rests on the idea of governance as territorial order, produced from a territorial synchrony of politico-administrative institutions, societal processes and cultural adherence (as described by Hajer 2003). It sees the UN's centralised, technocratic style of environmental managerialism as a natural quest for planetary order; similarly it sees international conservation efforts as cooperative problem-solving for the good of humankind. This model is thus unable to acknowledge how this international policymaking might be hegemonic.

Any policy model derived from a modernist, problem-solving orientation that assumes that problems are objective, sees policy as rational problem-solving rather than as an exercise of power. Moreover, such a model defines an effective implementation process as one with methods and systems of controlling conflict and helping groups resolve their differences, in order to put a policy into action (Parsons 1995 p. 470). Such models reduce conflict and bargaining to a single teleological purpose—achieving shared goals—thus masking how tensions and conflict shape policy processes.

There are, however, other models of the policy process that do not exhibit the same problems as these two, and which recognise relationships besides cooperation. One view, a political perspective applied to public policy, centres on the idea that policy is part of on-going processes of negotiation, bargaining and compromise amongst multiple self-interested decision-makers with differing amounts of power and authority (Dobuzinskis 1992). This model is based upon the idea that groups and individuals all seek to maximise their power and influence; decisions reached are politically feasible rather than desirable; they are not necessarily rational (Ham and Hill 1993 p. 67) (Parsons 1995 p. 470).

Also insightful is the notion that policy is not necessarily the deliberate outcome of grand strategy; chance may also play a role—policy may result merely because certain people were in certain places at certain times (Coleman and Perl 1999 p. 707). March and Olsen built on this idea when they developed their 'garbage can' model of policy formulation. Beginning with the assumption that the level of intentionality, comprehension of problems, and predictability of relations often assumed among policy actors does not exist in reality, they argued that decision opportunities are a garbage can into which participants dump various problems and solutions (March and Olsen 1979 quoted in Howlett and Ramesh 1995 p. 144-145). This emphasises the non-rational (but not completely irrational) nature of policy, based on convenience and ritualised decision-making behaviour (Howlett and Ramesh 1995 p. 139-141, 144-145).

In approaching international policy crossing national boundaries as something more than a cooperative and rational exercise in problem-solving, elements of both March and Olsen's and Dobuzinski's

perspectives are useful: policy heavily influenced by ritualised decision-making and by what is politically feasible—politics as the art of the possible in which chance and contingency also play roles. But this cannot perceive of the people involved in policy as being 'dispersed' over a range of multiple positions, discourses, and sites of struggle, as post-structuralism does.

Post-structuralism and policy

In post-structuralism, reality is a configuration of discursive practices that constitute, and exercise power over, subjects (Jones 1993 p. 118). The idea that policy is part of a larger discourse is the basis for Chapter Two's description of international environmental policy. In this, there are similarities to postcolonial studies' insistence on the power of the discursive (e.g. Darby 2003; 2004).

Foucault and others have explained how discourses shape (enable and constrain) the way we think and talk about the world (Jones 1993 p. 106). Discourses thus both enable and constrain policy-talk and policy outcomes. Discourse enables environmental policy by conceptualising it as a way of addressing environmental problems. The global environmental policy discourse justifies the optimism that scientists, through policy, may be able to control nature despite the latter's complexity, thus saving the planet from human mistakes. The discourse justifies efforts to universalise policy and transfer it to areas far away, as universal panacea. In this, policy works through universals, knowledge that moves across localities and cultures, forming channels of communication. Universals (a term that contrasts with *particular*) are abstract properties and relations, particulars the concrete things that exemplify them (Bullock *et al.* 1988 p. 885). Universals are local knowledge in the sense that they cannot be understood without the benefit of historically-specific cultural assumptions. But through the forging of universals, policy is able to not only travel the globe—as aspirations and unfinished works, universals must travel across differences and distances (Tsing 2005 p. 7)—but to transcend culture.

As well as enabling policy, the global environmental policy discourse constrains our understanding of how the policy-talk and policy practices of that field are political processes (Chapter Three). Discourses constrain policy-talk and policy outcomes, by setting an envelope within which only certain scenarios are visible and by providing the framework for those concepts, heuristics, stylistic devices, stories, narratives. They categorise both nature and people, set the context for intervention and prescribe suitable forms of intervention and thus of agency, and administer silences. As determinants of what can and cannot be thought, discourses also define the range of policy options available to policy-makers, invoking the political activity of naming and classifying (Litfin 1994 p. 13; Shore and Wright 1997 p. 22 quoting Apthorpe without citing a reference for his work).

Yet, discourses, by themselves do not determine policy, agency does. Agency determines what concepts, stylistic devices, stories and narratives are used and how problems are framed. Although discourses provide the framework, agents initiate, apply and disseminate rhetorical strategies (Litfin 1994 p. 40). When there are multiple discourses circulating in the policy sphere, agency is important in determining which particular problem-framings, policy approaches and solutions enter in to 'official' policy. Those engaged in policy practices have some choice over which discursive and stylistic devices they draw upon. Furthermore, interactions amongst groups of people—discussions, allocated roles, formal decision-making processes—all have some effect on policy framing and on outcomes.

Additionally, what a discourse does, whom it acts upon, the forms of resistance it meets (if any) are all open to transformation (McHoul and Grace 1998 p. 46). Although a multitude of acts over time by different agents is required to transform a discourse, discourses may change, and new discourses emerge. The technical practices of science and conservation, for example, shape the agency of experts in international environmental policy and they have the potential to transform the discourse of global environmental policy.

Yet, agency is downplayed in Foucault's conceptualisation of discourses as knowledge/power complexes, which have little sense of the complexity of plural discourses, power relations within society, or the social context in which many discourses and practises proliferate; they therefore lack an adequate model to tease out links between different discourses, social groups and institutions (Swingewood 2000 p. 200). When discourse is disengaged from agency in this way, a functional and teleological explanation is implied, the discursive formations constituting the needs and purposes of modern disciplinary society (Swingewood 2000 p. 200). This produces some extreme interpretations, as in Escobar (1995) and Sachs (1992) who see science and its associated institutions as somehow monolithic and integrated, simply reproducing relations of power due to their historic location (Leach and Fairhead 2000 p. 36).

Although post-structuralism is useful in examining the relationship between policy and discourse, a sense of agency is too important to overlook. If instead we put the people who act, rather than actions, in the centre of a theory of society this allows societies to be seen as networks, and policy as the output of those networks of people. This links back to Latour's argument that critics of modernity need to make visible the acts of mediation and translation and the networks by which claims are transformed into facts that modern thought has rendered invisible (Latour 1993 p. 37). Thus, while a post-structuralist analysis of policy is useful, it is far more so if combined with an approach focusing on people, networks, connections and flows.

The approach taken in Peet's critical policy

One of those who draws upon, but seeks to extend, Foucault's notion of the expert production discourse in explaining policy is radical geographer Richard Peet. In developing a framework for analysing international policy, Peet is trying to move Gramscian notions of the social production of hegemonic commonsense in the direction of expertly-produced Foucauldian discourses (Peet 2004).

According to Gramsci, a hegemon successfully projects their own particular way of seeing the world, human and social relationships, in such a way that those whom it subordinates accept this as 'commonsense', part of the natural order (Bullock *et al.* 1988 p. 379). It is possible to extend this notion of hegemonic commonsense to cover people socialised into policy positions as Peet *et al.* (2003) attempt for international economic policy emanating from Washington DC. But more than that, when investigating how international policy arises as an instrument of governance, Gramsci's notion of hegemonic commonsense can be applied to the everyday work of those influencing policy across national boundaries and/or within international agencies. These agents exercise control in a way that projects their own particular way of seeing the world, human and social relationships with the result

that this is accepted as 'commonsense' and part of the natural order by those who are, in fact, subordinated by it.

Peet (2004 p. 18) suggests that policy produced by experts with particular political beliefs appears as commonsense not only through the symbolic representations it employs, but also through the aura of responsibility accrued to it as an apparently pragmatic approach representing the common good. He (2001) attributes the hegemonic depth of a discourse to its ability to restrict serious, 'responsible' consideration to a limited range of topics or, more generally, to its ability to specify the parameters of the practical, realistic and sensible among linked groups of theoreticians, policymakers and practicians. In a study of international economic policy titled *Unholy Trinity*, Peet and his students (2003 p.17, 201-204) explain how the economic hegemony of neoliberalism is achieved. They suggested that the depth of hegemony in policymaking resides in the ability of a discursive formation to specify the parameters of the practical, the realistic and the sensible, limiting thought and expression:

> Positive reinforcement and negative compulsions of silence are concentrated in 'discursive restricted spaces'—places where insider status is paramount, where only one discourse is effectively permitted, where critical discussion is limited to variants of a given discourse, where other positions are disciplined as irresponsible, and where using a different discursive terminology means that real critics are simply not heard (ibid).

Peet's model rests on a neo-Marxist centre-periphery model of the world, categorising social interactions into the binary pattern of hegemony and counter-hegemonic resistance. In the dialectical perspective of the neo-Marxist model, societal dynamics emerge from contradictory oppositions, crises, and social conflicts (Peet and Watts 1993 p. 242). (Possibly, this derives from European Enlightenment logical tradition which expresses a self searching for power over that which is 'other' (Peet and Watts 1993 p. 229, 242)). Hinchcliffe (2000 p. 221) observes that this dialecticism treats areas labelled as resistant margins as distinct regions that are somehow (still) beyond the core, independent entities fighting to maintain their independence from that core. This presents the world as a collection of pre-constituted objects, the background contexts of which somehow magically help to explain the shortcomings of ensuing orders rendered visible through a grid of causal powers (Hinchcliffe 2000 p. 221). Thus the dialectical perspective of the neo-Marxist model is based upon a teleological view of a world where the margins, although resisting the core, are nevertheless being shaped and defined by its capitalism. Furthermore, this perspective precludes thinking of reality as a more complex entanglement of relationships—dispersed rather than centred power.

A politics of connectivity: the concept of relational power

A recent issue of *Geografiska Annaler* addressed this difficulty by utilising the notion of relational space and power. Allen's (2004 p. 31) views of power as neither centred nor dispersed but as a relational effect of interaction able to be traced through its connections, suggests a way of investigating how power is exercised over space. Instead of a binary model of the policy processes that recognises only impact or resistance, this provides a model that conceptualises power relations exercised through a variety of different modes, each of which is constituted differently in time and space (Allen 2004).

This issue of *Geografiska Annaler* addresses another difficulty, that associated with analysing the interface between the global and a particular 'local' or locale (e.g. the Fiji archipelago). That interface is problematic for reasons not just semantic (as mentioned in Chapter One) and methodological (which I address in the manner described in the text box following). The global and the local are problematic because they are ambiguous concepts—scales, processes, and levels of analysis as well as places or locations (Escobar 2001 p. 152). As geographers are aware, scales are socially constructed as are places (Rankin 2003). Furthermore, as Kelly (1999 p. 396) observed: "Too often we read about global processes and local processes as if the two followed separate logics"—as if a dividing line could be drawn between these. Social processes—environmental policy processes are essentially social in nature—that operate at global scales do not play out separately to those at local scales.

To address this, I have grounded the study in particular conceptualisations of the global and the local, in order to incorporate both an agency of place *sensu* Massey (2004), as well as a sense of power as a relational effect of social interaction *sensu* Allen (2004). To Massey, spatial identities are forged in a relational way, internally complex, essentially unbounded in any absolute sense, inevitably historically changing. Rather than place being concrete or grounded, Massey sees it as a meeting point, the location at which disparate trajectories intersect. She sees the global as local, global space being no more than the sum of relations, connection, embodiments and practices (Massey 2004 p. 8).

As a spatial entity, the outer edges of reefs in the Fiji archipelago define an inside-outside boundary. One can imagine influences arriving from outside the archipelago: policy ideas, knowledge, information, and funds originating 'outside' and crossing the boundary into Fiji. The technologies by which they arrive may be recent innovations—the Internet and email—or older technologies such as journals and books published internationally, people travelling to international conferences and meetings, letters posted and telephone calls made. The archipelago is a defined place. But this boundedness does not capture any sense of a politics of connectivity. In a study of international policy connecting with the Fiji Islands, it is too easy to see the archipelago as the product of the global, moulded by global forces arriving from outside. Instead, when observed through Massey's lens, the Fiji Islands' locations with which international policy initiatives connect are neither the victim of globalisation nor a centre of resistance fighting off those forces. They are instead a moment in which the global is constituted, invented, co-ordinated, produced (Massey 2004 p. 11). In most of the matters concerned with Fijian coral reefs, Suva, Fiji's capital, proved to be the place in which international policy initiatives first connect with the local when they crossed the outer boundary of the reefs ringing the Fijian archipelago. Thus Suva represents what Amin (2004 p. 43) called a distinctive 'nodal formation' in a study of the politics of connectivity, a place locked into a multitude of relational networks of varying geographical reach. Combined with an ethnographic methodology (below), this provides a way of studying the connections being forged in international policy processes (Level 1 in Table 1). It complements a post-structuralist approach to the second level of inquiry, investigating the paradigms and discourses used to discuss international environmental issues, to construct values and identities, identify interests, and assign rights, responsibilities and roles.

In studying this type of international society in which physical contact may be intermittent but communications, discursive and material influences may be prolific, global ethnography's notion of modes of cultural interconnection across the world is helpful. Social studies of science, particularly the sociology of scientific knowledge and actor-network studies, provide another useful perspective. Latour suggests the utility of thinking about how, in international environmental policy, hybrids of nature and culture are created and mixed into networks, and those networks lengthened to enrol people from places near and far, while all the time the dichotomy between nature and society is shored up.

METHODOLOGY: POLICY AS A SPATIAL PHENOMENON

Distinguishing between the international and the Fiji arena of policy, I used different methodologies to explore each, to limit the research to a manageable project. I concentrated field research on Fiji Islands sites. In researching how coral reef policy is arising from other international sites (the offices of multilateral organisations, secretariats of environmental regimes, and policy offices of major conservation NGOs for instance), I mainly examined documentation—meeting agendas and reports, speech notes, brochures, and published articles, and I attended the 10th International Coral Reef Symposium held in Okinawa, Japan in June-July 2004. To study the policy at the Fiji Islands end, I positioned myself not as an insider as many anthropologists do, but as a fringe observer, an occasional attendee at meetings, an interviewer, a conversationalist, and an enthusiastic seeker of written material (unpublished papers, conference reports, meeting minutes, brochures, project documentation)—all the time known as an environmental researcher working 'at home' (Evetts Place, Suva). In this way I was able to maintain a certain distance, overcoming the problem that ethnographers of globalisation face in researching everyday and familiar knowledge practices—the impulse to render the everyday strange and exotic in order that it might be apprehended as ethnography (Riles 2000 p. 5). Working from written texts as much as oral ones also helped provide the intellectual distance needed for this analysis. This tactic proved particularly important because, although I explained my work carefully to all I interviewed and met at workshops, and although I got better at distilling and communicating the essence of it, in three years of PhD research in Suva I never encountered anyone whom I felt understood what it was I was seeking to do. In the jargon of critical analysis, all were immersed in the orthodox version of the discourse to an extent that precluded both reflexive, critical self-analysis and comprehension of my approach.

INVESTIGATING HEGEMONY

Notions of hegemony in international relations: conflicting interpretations

Even as the political nature of international environmental policy starts to become visible through the use of post-structural perspectives on discourse analysis and through Chapter Three's review of

anthropological and 'alternative' accounts in various social science disciplines, some fundamental difficulties remain in investigating hegemony. A key difficulty arises from the various concepts of hegemony found in certain International Relations perspectives. Walker (2002) analysed how notions of modern politics in this discipline express the international as a normative account of the 'proper' relationship between equality and inequality, with hegemony as one reading of the way in which the international system is constituted. Anarchy is another reading. As Walker (2002 p. 22) explains, the hegemony narrative in International Relations portrays the legitimacy of hegemons as a condition of international order as long as that order remains pluralistic; in other words, one cannot have order without hegemony. On occasions, this narrative takes the form of 'hegemonic stability theory', arguing that a dominant power or hegemon must be able to and willing to bear the 'cost' of providing 'the public good' of a strong international regime (cajoling and disciplining others, and preventing 'free-riders'), in order to ensure international stability (Cox 1994).

Discussions about international environmental governance have paid some attention to this notion of hegemony. Young (1989 p. 204) proclaimed that "the hegemonic stability thesis is dead" with respect to environmental regimes and Litfin (1997 p. 173) argued that the majority of environmental regimes have been established in the absence of hegemonic state interests. In contrast, Wapner (2003 p. 7) considers the US to have led the international community on environmental matters for many years until it recently abrogated that role (as mentioned in the previous chapter). Wapner's comment suggests there is still some notion that the US has been, and may again yet be, a hegemon in matters of international environmental policy. Arguments about international security and the need to address international environmental degradation cooperatively also reflect this view. For instance, Elliot (2004 p. 309) argues that the US should be funding environmental aid, providing technical assistance, and transferring technology to Southeast Asia region to compensate for the consequences of its over-large 'ecological footprint' upon the earth and for the externalisation of the environmental costs of its own economic activity. Elliot is, in effect, advocating US hegemony in environmental matters to balance its dominant role in causing environmental degradation.

In International Relations, this hegemony narrative tells not only of the formal necessity of hegemony as a way of maintaining order in the international system, but also about the empirical impossibility of equality among sovereigns on a spatial ground of competing sovereigns (Walker 2002 p. 22). The narrative is thus a normative account of the 'proper' relationship between equality and inequality maintaining world order. There is, however, another interpretation in International Relations of the utility of hegemony. This appears in a quasi-Kantian narrative about the necessary process of state inclusion into the modern state system which provides a key means for legitimating states' claims of inequality (Walker 2002 p. 21). In Chapter Two, this alternate interpretation appears in the argument expounding the necessity of modernising Third World countries in order to address both environmental degradation and poverty (as in the WCED report, but also as widely propounded at WSSD). In this alternate narrative, technical assistance, financial aid and capacity-building are all seen as beneficial products of Western hegemony, rights due to developing countries (Chapter Two). Here, hegemony is interpreted as having a positive side for developing countries, a different interpretation to the value

accorded it in the hegemony narrative. Moreover, while this quasi-Kantian narrative seeks a process of inclusion and equality, the hegemony narrative depicts that process as impossible.

These contradictory interpretations are not, however, the full story about hegemony to be found in International Relations. Yet another narrative, which Walker (2002) calls 'colonial/modernisation', tells yet another story. It "enables a temporal story about modernisation as the bringing-in of the undeveloped, the nonmodern, into the civilised world of statist inclusions/exclusions" (Walker 2002 p. 22). In other words, modern theories of international relations incorporate this linear account of history as modernisation and 'development' into a structural account of international order which depends on various historical practices of exclusion and which, in turn, renders specific practices of inclusion necessary and natural (Walker 2002 p. 10). For Third World societies, this 'colonial/modernisation' narrative adds the allure of development, and hope for its fulfilment, to the narrative about inclusion. While not explicitly addressing hegemony, by default it adopts a positive and hopeful (for developing countries) interpretation.

This positive interpretation of the utility of hegemony is at odds with that found in postcolonial theory seeking to decolonise the international. Darby (2004 p. 7) argues that International Relations has been complicit in shoring up a hegemonic world order, naturalising the terms of reference and derailing Third World attempts to change the currency of the debate by exposing the influence of race and resources on thinking about the expansion of international society. He describes the contemporary conception of global order as part of a project to globalise the Third World, efforts aided by a grand narrative (Darby 2004 p. 7-9).

> [This grand narrative] holds out the prospect of global management along with the promise of popular ratings: elements of a blueprint, yet humanised and often appealing to immediate need. There is also a oneness in another respect: that of one world. The vision is of people's everywhere, linked together, bound for a single destination (Darby 2004 p. 8).

Darby (ibid) suggests that the appeal of this grand narrative (which Tsing calls the charismatic attraction of the global, as mentioned in Chapter One) comes from the way in which it meshes neatly with the postcolonial reassertion of Western leadership.

In any effort to decolonise the international, the hegemony of western leadership over Third World societies is something that needs to be exposed and overcome. In other words, the project of decolonising the international must privilege the non-West rather than the West. This is the attitude taken in the critiques of hegemony in international environmental summarised in Chapter Three. There, certain philosophies, organisations and policy technologies (such as the accounts of green neoliberalism; fascist eco-philosophies, eco-imperialist IGOs and NGOs, and the administrative technologies of major conservation NGOs described in the previous chapter) are regarded as hegemonic, or potentially so; they are being considered undesirable instruments of domination.

To summarise, there are, amongst International Relations' various perspectives of the way in which contemporary international system is constituted, tensions between interpretations of hegemony and the teleological promise of modernisation. These tensions impact on how we see and analyse hegemony. The idea of hegemony as necessary for maintaining order in a plural international system is orthodox

First World thinking, as is the appeal to a quasi-Kantian narrative about the necessary process of inclusion into the modern state system. Post-colonialist analysis suggest that these established conceptions of the political, along with orthodox scholarship and intellectual critique, underwrite Western dominance and enrol the Third World into such conceptions through their seductive allure and certain hope (Darby 2004 p. 3). Orthodoxy shapes the predominant forms of its critiques. Stepping outside orthodoxy requires new forms of critique, such as the efforts to decolonise the international that Darby (2004) advocates. This means going further than the interpretations of hegemony in Chapter Three which privilege the non-West but provide sparse detail about what of the local is being displaced or eclipsed and in what regard are people subordinated, disadvantaged or disempowered, and about who is establishing relationships of domination and how this is being effected. The empirical study of coral reef policy needs to address these matters. This requires a clearer idea of the nature of hegemony as well as a defined position from which to investigate it.

The nature of hegemony

Domination is one part of the relationship of hegemony; the other part entails the willing acquiescence of those accepting subordinate status[1]. There are two ways in which this domination can be perceived (and therefore analysed). The first is as a relationship within which forms of agency develop. Relations of domination can develop capacities for agency through legitimation of ideology or perhaps, through the legitimation of desires, imaginaries and metaphors that do not quality as fully fledged ideologies (Warren 1992 p. 34-35). According to Warren (1992 p. 35), this concept of domination is found in the writings of Weber, Gramsci and Habermas, and was hinted at by Foucault. Domination can also be viewed as a mode of power. According to Allen (2004 p. 28), dominating power entails constraint and the removal of choice further down the line. Sharpe *et al.*(2000 p. 2) describe dominating power as that which attempts to control or coerce others, impose its will on others, or manipulate the consent of others—power that engenders inequality and asserts the interests of a particular social group or political configuration at the expense of others.

Hegemony is a particular type of domination, the capacity of a dominant group to exercise control through people's acquiescence to subordinate status. In political geography and geopolitics, the notion of hegemony is used to refer to the practices through which élites and power blocs maintain the dominant storylines that help consolidate existing power relations (Johnston *et al.* 2000 p. 333).

The accounts of hegemony in international environmental policies discussed in Chapter Three largely concentrated on the domination aspect of hegemony rather than the element of acquiescence, suggesting the need to pay the latter attention in an empirical investigation. Those accounts also overlooked the question of whether there is any intention to dominate. Approaching hegemony from

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[1] Although Sparke (2004 p. 779) uses Stuart Hall's work on race (1980) to interpret dominance as a particular form of hegemony articulated (and thus both experienced and consolidated) more through coercion than through consent, I take a slightly different approach, interpreting domination as part of the phenomenon of hegemony. I did so before reading Sparke. I suspect, however, these two interpretations offer much the same analytical framework. Both require searching for instances of coercion and consent, and comparing those with other modes of power being exercised.

the point of view of those subordinated, Gramsci addressed not intentionality but consciousness. He considered the potential for collective human action to be built upon self-conscious human groups, and assigned 'organic intellectuals' the role of raising consciousness (Cox and with Schechter 2002 p.105). In doing so, he assigned an active role to human consciousness in the construction of the external world (Femia 1981 p. 128). The idea of coercion, presumably intentional, was also central to Gramsci's concept of hegemony. Nevertheless, the intentionality of domination remains an unclear aspect of this concept. It is also unclear in Peet's various analyses discussed earlier in the chapter.

Peet (2001) suggests that hegemony begins as a prevailing rationality or sense of practicality within a community of experts. He argues that 'institutional complexes' produce hegemonic discursive formations that, in policy terms, capture the prevailing sense of practicality and responsibility (Peet 2001). This moves hegemony away from the concept of intentional coercion towards a notion of discursively or institutionally-produced domination. Yet, some empirical studies have shown that the achievement of hegemony requires sacrifice and compromise, vigilance and hard work by élites (Johnston *et al.* 2000 p. 334).

The question of intentionality is important because power may be the effect, not the cause of action. The act of domination may just be an act of ordering—arranging, organising or delegating—a way of gaining strength from the careful plaiting of weak ties *sensu* Latour (1999), without any explicit intention of one party dominating another. It may be the creation of pattern, intended to generate consensus (as with Riles' analogy of Fijian mats, discussed in Chapter Three). Patterning and ordering may not be carried out for power itself (as in sovereign models of power) but for a host of other organisational aims that are the outcome of a diversity of linguistic and material practices (Hinchcliffe 2000 p. 223). The sociologist Elias (1997) was interested in this question, analysing the relationship between intentional attempts to control and transform the social world and the long-term unplanned processes of development within which they take place. On the other hand, Latour generally overlooks this question, referring at one point to unconscious thought (i.e. Latour 1993 p. 37).

The difficulty of ascertaining intentionality in a social context

In Chapter One I explained how social theory fails to deal with the issue of intentionality. Van Krieken (2002 p. 267-268) suggests that understanding the relationship between social order and intentional attempts to control and transform the social world requires a return to earlier social theorists' work on the concept of habit or habitus, something Talcott Parsons removed from modern social theory (Camric 1986 p. 1074). The concept of 'habit', according to its dictionary meaning, denotes a more or less self-actuating disposition or tendency to engage in a previously adopted or acquired form of action (Camric 1986 p. 1044). 'Habitus' is a particular term used to refer to the durable and generalised disposition that suffuses a person's action throughout an entire domain of life (Camric 1986 p. 1046).

Bourdieu used a similar notion—habitus as a system of durable dispositions or properties that we carry around in our heads as a result of our social experience in certain kinds of backgrounds, social settings and circumstances—to help explain how people act. As explained by Layder (1994 p. 156), our social experience, predisposes us to approach the world with certain knowledge and interactional resources. Habitus functions as non-conscious principles which generate and organise practices and

representations (Swingewood 2000 p. 215). "When confronted with routine everyday situations, habitus tends to reproduce" (ibid). Bourdieu also divided social context into fields (e.g. education, religion, the arts), each with their own distinctive logic, principles and body of specialists. He theorises that habitus operates in these fields, which correspond to networks of objective positions that various agents occupy by virtue of possessing different forms of economic and cultural capital (material and intellectual skills, wealth, knowledge) and symbolic capital (accumulated prestige and a sense of honour) (Swingewood 2000 p. 212-213). People involved in a field such as international environmental policy therefore act through a type of second sense, socially constituted, about the field they are in and how the game is played. Bourdieu made the point that people become socialised into fields not through norms, but cognitively by a process of internalising the social structure of the field itself (Swingewood 2000 p. 214). He argued that agents transpose the objective properties of a field (the hierarchy of positions, traditions, history, institutions) into 'mental structures' or 'frameworks' which then work to condition the ways they perceive, grasp and understand the field (ibid).

This, then, is the combination of theoretical perspectives I employ to repoliticise coral reefs and their experts, to conceptualise the political nature of policy processes bound up with science and nature. Within this combination there are various tensions and unresolved difficulties, discussed next.

Tensions and Difficulties

TENSIONS BETWEEN MODERNIST AND POSTMODERNIST INQUIRY

One of those tensions stems from a basic premise in this study, the Nietzschean belief that we create what we think of as knowledge out of our experience, that knowledge being so thoroughly dependent on our psychological, historical or social conditions that it cannot be considered objective knowledge at all. In treating power and knowledge as inseparable, this approach rejects the modernist belief that knowledge is divorced from political power and science transcends politics and is equally advantageous for all concerned (Chapter Two). This stance is often called postmodern (e.g. Edgar and Sedgwick 1999 p. 294-298). Although employing the perspective that all knowledge is political (reflecting the interests of its knowers and informed by power relations), the thesis is not affirming a postmodern world. Rather than viewing the society from which this policy is springing as postmodern, I perceive it as modern in the sense that Latour (2004) used this term:

> Not a period, but a form of the passage of time; a way of interpreting a set of situations by attempting to abstract from them the distinction between facts and values, states of the world and representations, rationality and irrationality, Science and society, primary qualities and secondary qualities, in such a way as to trace a radical difference between the past and the future that makes it possible to externalise definitively whatever has not been taken into account (Latour 2004 p. 244)[2].

[2] An expression from philosophy, 'primary qualities' distinguishes the fabric of which the world is made (particles, atoms, genes, neurons etcetera) from representations (colours, sounds, feelings etcetera); primary qualities are invisible but real and never experienced subjectively; secondary qualities, visible but nonessential, are experienced subjectively (Latour 2004 p. 247).

Nor am I suggesting postmodern culture as the future of Pacific Islands. Rather, I am seeking to open up other ways of seeing their future, which are predicated on a much greater awareness of the politics embedded in environmental policy projects and approaches being offered to and thrust upon them.

In re-imagining international environmental policy, and re-politicising it, this thesis uses both modernist and postmodernist modes of inquiry. Accumulating knowledge about coral reef policy processes, and critically analysing their rationality and logic—the employment of cognitive reason in a search for explanation and coherence—is a modernist mode of inquiry. These two modes of inquiry are at times in tension, as the above discussion revealed. They are also in tension when considering whether some aspects of coral reefs are socially constructed and some are not, also discussed earlier in the chapter. Tension also exists between post-structuralist notions of expert-produced discourses and Bourdieu's notions of fields of expertise and habitus, applied in Chapter Eight to explain unconscious repetition of standard arguments and metaphors common in coral reef policy. Bourdieu's notions retain a sense of structure as the external social context of behaviour while a post-structuralist perspective suggests that subjects are dispersed over a range of multiple positions, discourses and sites of struggle.

I have tried to use those tensions constructively to enquire more deeply into the nature of international environmental policy than either a purely modernist or postmodernist mode of inquiry would allow. For example, post-structuralism, with its notion of expert-produced discourses, helps us understand how certain discourses containing an inherent notion of domination, enable and constrain policy-talk and policy statements. In a complementary way, Bourdieu's notions of field and habitus provide a way of understanding how institutionalised technical practices may build a hegemonic politics; discourse and institutionalised technical practices may each contribute to a relationship entailing domination of one social group over others.

Other tensions remain however, between modernist and post-modernist modes of inquiry. When the belief that all knowledge is political is combined with the idea that science and science/policy are political fields of endeavour that blend into one another, a particular problem arises. How can one distinguish between 'good' science and 'inadequate' science used to frame environmental issues and promote certain policy stances?

If environmental problems are framed in a manner appearing to be, or claimed to be, underpinned by science, then a modernist would expect science to conform to some notion of accepted standards in the pertinent scientific discipline. If the science does not so conform, it may merely be inadequate in a hypocritical sense, based upon sloppy or lazy work for example. Alternatively, it may be an example of what Latour (1993 p. 38) calls power shoring up reason and reason shoring up power, as I explore in Chapter 13. But the postmodern view provides no such standards for evaluating science as good or bad, since it regards all knowledge as the historically contingent product of linguistic and social practices of particular local communities of interpreters, with no assured 'ever-closer' relation to an independent ahistorical reality (Tarnas 1991 p. 399). How, then, can one argue that a certain framing of an environmental problem is inadequately researched and thus forms an inadequate basis for scientific and empirically-based conclusions? Such standards are modern not postmodern. This is where the tensions between modernist and postmodernist modes of inquiry emerge. In part, this difficulty arises from

treating all knowledge as political without acknowledging that, when knowledge is used in policy, it is not always consciously used as a political resource.

For the purposes of this study, there is, I argue, no analytical difficulty in recognising that various contemporary fields of science have standards for the production of scientific arguments through research; scientific work can therefore be graded according to those standards—which may encompass degree of effort, logic, reproducibility, and verifiability, for example. Judging whether or not policy should be based upon work that may fail to meet those standards is another matter. That is a political judgement, not just a question of whether 'good' science (conforming to recognised standards) is valued but of the various values which people may seek to have represented in policy. For some, it may also be an ethical matter. In this study of how coral reef policy arises as an instrument of governance, what is relevant is whether in these science/policy practices, there is any intention to dominate, any intentional exercise of subordinating power. Since my aim is to open up space for contemplating alternative political futures, it is useful and sufficient to reveal, rather than judge, any such political interest or intent, as expressed by the actors involved.

THE CONTROVERSY OF REPOLICITISING SCIENCE AND NATURE

The tensions revealed above are an example of the invincibility of the moderns that Latour (1993) describes. The act of making the politics underlying environmental policy visible can be controversial, particularly when it entails revealing how environmental issues are socially constructed. Critics of social constructionism charge that this act of revelation amounts to a denial of the existence of environmental problems and does not contribute towards managing them, a criticism summarised in Burningham and Cooper (1999). Some natural scientists and conservationists have rejected postmodernist interpretations of (knowledge of) nature on the grounds that extreme relativism and an 'anything goes' attitude is an obstacle to addressing the environmental crisis or that it leaves no epistemological secure foundation from which to speak truth to power (as explained in Darier 1999 p. 2-3; Demeritt 2001 p. 28).

The practice of demystifying the social construction of environmental issues challenges scientists to make known the human values upon which they base their work—those underpinning the discipline of conservation biology, for instance. This can be threatening because, as Demeritt (2001 p. 37, quoting Latour) affirmed, questions of epistemology are also questions of social order. By exposing the strategies and relations of power associated with scientific practices, post-structuralist analysis can destabilise or counter dominant (hegemonic) discourse (Jones 2002 p. 250, footnote). It thus generates criticism. Those who do not wish to be challenged cast those challenging them as environmental villains. For instance, introducing their multidisciplinary collection *Reconstructing Nature? Responses to Postmodern Deconstruction*, editors Michael Soulé (the founder of conservation biology), and historian Gary Lease wrote "[The contributors] agree that certain contemporary forms of intellectual and social relativism can be just as destructive to nature and bulldozers and chainsaws" (Soulé and Lease 1995 p. xvi). Such criticism is one of the factors making it difficult to step outside the orthodox version of the discourse of international environmental policy. It is a brick wall erected by those who

do not wish to see the political basis of international environmental policy discourses, or the social construction of its discursive elements, demystified and open to questions.

It is not the act of post-structuralist or postmodern critique *per se* that is threatening but the revelation of the political basis for environmental policy and the interests of those involved, along with the notion that Nature may be beyond our influence and control. As Latour (1993 p. 36-37) wrote: "The exclusive transcendence [existence above and apart from the material world] of a Nature that is not our doing, and the exclusive immanence of a Society that we create through and through, would nevertheless paralyse the moderns who would appear too impotent in the face of things and too powerful within society".

PROBLEMATIC TERMINOLOGY

During the course of the research, I also encountered semantic problems in trying to describe situations observed and in trying to construct a theoretical argument. Sometimes these became epistemological problems. These problems occurred primarily when terms available to describe a particular phenomenon were inadequate. I cited one such example in Chapter One: the processes surrounding policy for which I have used 'endeavours, 'ventures' and 'processes' interchangeably, for lack of a more prescriptive term. This section describes other such problems and how I addressed.

Having adopted a notion of relational power, I did not have specific language to name the plural collection of entities connecting, on matters of coral reef policy, with the Fijian archipelago over space and time. The 'overseas' was not a single locality or activity, but numerous such instances that were somehow connected into a sphere of activity concerned with coral reef policy on an international scale. I therefore referred to these collectively as 'international policy initiatives', or as 'the international sphere of coral reef policy' even though those expressions disguise their multi-site, temporal and relational nature. In empirical descriptions, it is hard to retain both Massey's sense of the global as local and Amin's concept of the local as a place locked into a multitude of relational networks because of the lack of suitable specific terms that capture these notions concurrently.

There are no suitable terms to describe the syncretism of science and policy either. The most common semantic solution, the term 'science for policy', maintains the ideal-type distinctions that I wish to disregard. Instead I call it science/policy. Rather than inventing a new language of hybrids to describe the human actors (experts) involved, which would require further (problematic) differentiation between science, politics and hybrids thereof, I use the labels that those generating texts use. If they call themselves a scientist, then so do I. If they call their documents scientific papers then so do I, while noting the policy content of those papers. This strategy overcomes the problems of terminology that would otherwise arise.

I found no suitable terminology to encompass the range of relationships encountered under the broad umbrella of cooperation in matters of international environmental policy. Part of the problem arises because the dictionary definition of cooperation includes the notion of working towards the same end, which may not be the case. On the other hand, the dictionary definition of collaboration, often regarded as a near synonym for cooperation in policy matters, includes the connotation of working traitorously

with the enemy (*Concise Oxford Dictionary*, 6th edition). Moreover, in aid projects the term partnership is often used, implying an equality that may not exist in practice. There being no satisfactory solution, I have used both cooperation and collaboration as general terms to cover working together on policy matters although not necessarily towards the same end or on an equal footing. Rather than forming generalisations about particular types of social relationship, I comment on the tensions and conflict existing in particular situations, categorising these into modes of power *sensu* Allen (2004).

Sometimes existing terms were unsuitable because they had several meanings, while I wished only to invoke one of those. For instance, I have confined use of the term 'discourse', to cover the Foucauldian discourse of global environmental policy described in Chapter Two. For other discursive elements, I have used the terms 'metaphors', 'stories', 'storylines', 'narratives' and 'arguments'. Brosius (2004) referred to new approaches to policy such as ecoregion planning as 'administrative technologies'; Peet *et al.* (2003) call them (or something similar) 'expert policy discourses'. I call them 'expert policy technologies' in order to differentiate them from Foucauldian discourse and yet retain the notion they concern the technical aspects of policy transfer.

One problematic generalisation I have been unable to avoid is the developing country/ developed country opposition. I use interchangeably the terms North and West, meaning Western Europe, North America, Japan, and Australasia; I call the remainder the South (the usual exceptions, some of the former Soviet bloc, do not enter into the analysis). I use the Third World as a synonym for the South. While the categorisation has many problems, so too do alternatives (Darby 2004 p. 2, footnote 2).

One other term deserves explanation. While I mainly use the word 'project' to refer to aid-funded enterprises that label themselves as such, I occasionally used it in the broader sense of a planned, systematic set of activities focused on a single issue, to draw attention to those characteristics.

Distinguishing organisations by type also proved problematic, given the exceedingly general terms available for this (e.g. NGO, IGO, state or hybrid, as discussed in Chapter Three). I therefore tried to avoid categorising groups of policy participants in this manner, concentrating instead on describing each significant organisation in a text box—or in the case of ICRI and its subsidiaries, in half a chapter (Chapter Seven). These text box descriptions cover an organisation's history, governance arrangements and geographical bases, as well as the type of role each plays in coral reef policy. This series of text boxes starts in Chapter Five.

Conclusion

To conclude, in establishing a base from which to interrogate coral reef policy, I am acknowledging a particular conception of the contemporary western world in which coral reef policy is being formed, one that broadly follows Latour's description of nature as a politicised concept in which science and academia are involved. Latour (1993 p. 35-36) describes a society characterised by strenuous, ongoing, taken-for-granted efforts to keep humans separate from non-humans, and science separate from ideology, while all the time hybrids between nature and culture proliferate. This is a paradoxical world in which politics are not always visible or conscious but are omnipresent (Latour 1993 p. 37-43).

This chapter identified the collection of perspectives needed to extend the critical perspectives in Chapter Three and to make those politics more visible by interrogating environmental policy that reaches across the globe to engage people from the Fiji Islands. This mélange is designed to remove myself from the norms and categories of thought that define how we usually think about the environment, science, policy and politics. On this basis, the examination of coral reef policy, set out in the next set of chapters, proceeds.

Part II

Interrogating International Coral Reef Policy

Chapter Five

International Concern about Coral Reefs

Introduction

This chapter describes how concern about widespread reef degradation in tropical regions has mounted over several decades to become an international issue. In the 1960s, some coral reef scientists worried that outbreaks of the crown-of-thorns starfish in several countries presaged an end to coral reefs. This proved unfounded, although local outbreaks continue. Then, amongst the coral reef science community, the aspiration of saving reefs from the depredations of humankind concern grew steadily, given added impetus in the late 1990s by widespread coral bleaching during El Niño events. Coral bleaching has been linked to global climate change, raising new fears about the extinction of coral reefs and leading to talk of a worldwide crisis.

This account of mounting concern is written in the style of the orthodox global environmental policy discourse described in Chapter Two. It is orthodox in describing environmental problems seen to be faced by coral reefs, according science a substantive role in defining those problems, depicting assessment and monitoring programmes as international environmental policy responses to those problems, and describing the organisations and individuals cooperating in those programmes. The chapter's function is twofold. While providing background material for an analysis of environmental policy concerning coral reefs, it also forms a base from which to begin a critical re-interpretation of those policy endeavours. It should be read in conjunction with next chapter, which investigates the discursive construction of the crisis, reinterpreting the role of science and scientists in this.

METHODOLOGY: CONCERN ABOUT CORAL REEFS

This is not just a review of growing concern about coral reefs worldwide. It is also an empirical investigation into what are the most visible and accessible ideas about the state of reefs—for there are, of course, different views amongst the world population, not all of which find their way into publications that I can access and read (English language accounts and to a limited extent, French web sites). When I went searching for English language literature expressing views on this subject, I found what I summarise here. To ascertain levels of concern I read scientific texts and papers on coral reefs, found through library catalogue and database searches. I searched Google and news web sites for popular articles eg BBC World, Economist, and ENN news. I twice did systematic Internet searches. I also saved articles I came across when looking for at other material on coral reefs, or when reading magazines such as *New Scientist*. To get a sense of what has spurred what, I placed events into chronological sequence, identified some key people and traced which events they had been involved at which times. For chronological accuracy, I cross-checked sequences of events.

Initial Concerns and Responses

THE RAPID EXPANSION OF SCIENTIFIC INTEREST

In the 1960s and 1970s scientific interest in coral reefs began to increase as scuba diving equipment revolutionised scientific reef research, allowing direct exploration of the upper areas of the seas. Scuba catalysed scientific expeditions to the tropics and stimulated long-term studies of coral reefs and reef organisms; these expeditions utilised newly established tropical marine laboratories in Jamaica, Panama, and Australia (Sapp 1999 p. 78). Scientists began to hold regular international coral reef meetings through organisations such as the IBP, the International Association of Biology Oceanography (IABO), and the Pacific Science Association (PSA) (Worthington 1975; Dahl and Carew-Reid 1985; Pacific Science Association Scientific Committee on Coral Reefs 1988). In 1980, the International Society for Reef Studies (ISRS) was founded to promote the production and dissemination of scientific knowledge and understanding of coral reefs; it assumed responsibility for organising the international coral reef symposia held every four years since the IABO initiated them in 1969 (see Table 6) (ISRS 2001). In 1982, the Society started the *Coral Reefs* journal, which continues today. During these two decades, international scientific interest in coral reefs reflected a general desire to understand reefs and their functioning, and to develop suitable management techniques to address the reef degradation being caused by human activities (Yonge 1969; Gomez 1983; Sapp 1999).

TABLE 6: INTERNATIONAL CORAL REEF SYMPOSIA

#	Year	Location
1st	1969	Mandapam Camp, India
2nd	1973	MV Marco Polo cruising the waters of the Great Barrier Reef, Australia
3rd	1977	Florida, USA
4th	1981	Manila, Philippines
5th	1985	Tahiti, French Polynesia
6th	1988	Townsville, Australia
7th	1992	Guam (US territory in Micronesia)
8th	1996	Panama City, Panama
9th	2000	Bali, Indonesia
10th	2004	Okinawa, Japan

Source: ICRI web site at www.icriforum.org; Sapp (1999)

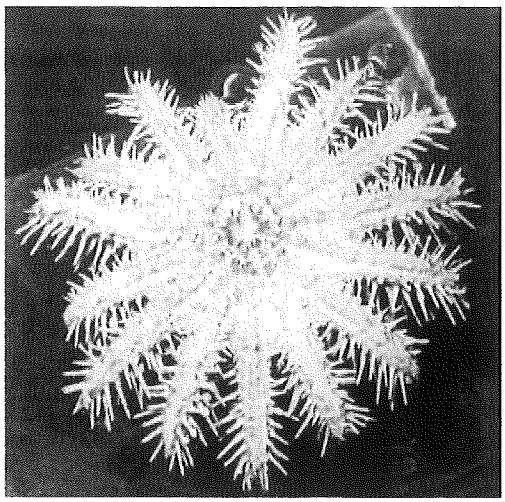
INITIAL CONCERNS ABOUT REEF DEGRADATION

Crown-of-thorns starfish, anthropogenic impacts

The first significant issue to raise scientific concerns about the future viability of coral reefs was the coral-eating crown-of-thorns starfish *Acanthaster planci* in the 1960s (Figure 1). Population explosions on a scale not previously recorded, observable with scuba, were devastating large areas including the Great Barrier Reef in Australia and several Pacific Islands (Sapp 1999). The cause of the population explosions was widely debated in the pages of *Science* and *Nature* journals and in marine science periodicals. Some thought that the outbreaks were due to natural causes (runoff from high land masses after periods of dry weather creating phytoplankton blooms which provide ample food for the starfish larvae and enhance their survivorship). Others suggested that the outbreaks were occurring because humans had removed the starfish's main predators, such as the giant triton (*Charonia tritonis*) sought for its shell (Sapp 1999 p. 8-9). This controversy remains unresolved (Sapp 1999).

Worried about the outbreaks, several scientists prophesised the end of coral reefs. Richard Chesher, one of the first to study the infestations in the Pacific is reported as saying in 1969 "There is a possibility that we are witnessing the initial phases of extinction of Madreporarian [hard] corals in the Pacific" (Sapp 1999 p. 204). A *State of the Earth Report* from the Smithsonian Institution for the Centre for Short-Lived Phenomena asserted that "if the starfish explosion continues unchecked, the result would be a disaster unparalleled in the history of mankind" (ibid). These dire scenarios have not eventuated.

FIGURE 1 : CROWN-OF-THORNS STARFISH



The predatory crown-of-thorns starfish prefer to live in sheltered areas such as lagoons, and in deeper water along reef fronts. In an outbreak, starfish number thousands, even tens of thousands. Some outbreaks may last for four to five years while others may have run their course within one or two years. They cause high coral mortality, sometimes over much of a reef. In the last fifty years, outbreaks have been reported many places including the Great Barrier Reef, the Ryukyu Islands (south-west Japan), Micronesia, American Samoa, the Cook Islands, Fiji, the Society Islands, Hawaii, the Red Sea, Maldives and East Malaysia.

Source: Moran (1997).

In addition to this uncertainty about the long-term impact of crown-of-thorns starfish (which only affected some reefs), scientists were, by the early 1970s, worrying about the way human impacts were impeding natural rates of reef recovery after cyclones, storms, disease outbreaks and sea level changes (Wells and Jenkins 1988 xix-xxii). Collections of black coral (especially in the Caribbean) and a new trade in ornamental corals mainly from Southeast Asia aroused concern. So did coastal development, overexploitation of various reef species besides corals, direct physical destruction from sand mining, dredging and destructive fishing methods, pollution and, in the Pacific, nuclear detonations (Salvat 1980; Gomez 1983; Wells and Jenkins 1988; Morozova 2000). These anthropogenic impacts were seen as diminishing circles of impact spreading away from centres of human population; damage was localised and large areas (and remote reefs in particular) were considered to be unaffected except by occasional fishing (Zann 1994; Bryant *et al.* 1998; Wilkinson p. 867).

Concerns about coral and fish collections in Southeast Asia

In the 1970s and 1980s the world trade in ornamental corals (commonly called the curio trade) increased rapidly. Collections of black coral and of ornamental hard corals in Southeast Asia in particular (mainly in the Philippines and Indonesia) caused concern among some reef scientists (Gomez 1983; Lovell 2001 p. 22). As a result of their agitation, all species of black coral (i.e. all corals in the Order Antipatharia) were listed under the Convention on International trade in Endangered Species of Fauna and Flora (CITES) in 1981, in order to regulate their international trade. In 1985 seventeen genera of hard corals were added, then all other species of hard corals (i.e. all corals in the Order Scleractinia) in 1990 (Green and Hendry 1999 p. 403). (I discuss trends in international trade further, later in the chapter.)

INTRODUCING THE PLAYERS: 1. CITES

Developed as the result of an IUCN resolution in 1963, the CITES convention entered into force in 1975 and by early 2005 had 167 states as parties. The convention aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Because this trade crosses borders between countries, efforts to regulate it require international cooperation. Conceived in this spirit of cooperation, CITES also places considerable emphasis on enforcement. It is a science-based treaty, justifying decisions to control trade in species through scientific assessment. CITES' members states meet every two to three years, as the Conference of the Parties (CoP). The Secretariat, based in Geneva Switzerland, receives policy advice from a standing committee composed of country members selected on a regional basis. Three committees of experts (plants, animals, and nomenclature) advise the CoP and standing committee.

Since 1981 coral reef species had gradually been added to CITES, which now covers all species of stony corals, black corals, blue corals, organ pipe corals, fire corals, lace corals, giant clams, sea horses, the queen conch, seven species of sea turtle but only one species of fish, the giant humphead wrasse *Cheilinus undulatus*. These species are all in Appendix II which lists species not necessarily threatened with extinction (those are in Appendix I), but which could become so if trade were not strictly regulated.

Source: web site at www.cites.org, Green and Hendry (1999), UNEP Coral Reef Unit and WWF Coral Reefs Advisory Initiative (2003)

It was not only the level of coral extraction that was causing concern. Since the 1960s, the practice of using cyanide to catch fish for the aquarium trade had spread from the Philippines to other Southeast Asian countries and to the live food fish trade (International Marinelife Alliance 2000; McAllister *et al.* c.1997). Cyanide kills various reef species and destroys the reef itself. In the early 1980s, sudden death syndrome amongst fish imported to North America created confusion among importers, retailers and hobbyists, US aquarist Steve Robinson subsequently linking this to cyanide fishing (Steve Robinson, *pers. comm.* July 2004). Two years later the North American pet industry, concerned to ensure a supply of healthy fish imports, sent a fact-finding mission to the Philippines. When the team suggested the American aquarium industry should encourage collectors to use nets instead of cyanide, several North American NGOs collaborated with a local NGO to run training programmes (Baquero 1999).

Changes in Caribbean coral reefs

While anxiety over the coral trade focused mainly on Southeast Asian reefs, other issues focused attention on Caribbean reefs. Since the 1980s, some Caribbean reefs, particularly in Jamaica, have changed character dramatically. Live coral cover on many Caribbean reefs is thought to have declined from 50 to ten percent over the previous 25 years (Wilkinson 2004 p. 14). Dominated by *Acropora* elkhorn and staghorn corals for many thousands of years, they are now dominated by algae, a

phenomenon commonly referred to as a 'phase-shift' (Buddemeier *et al.* 2004 p. 25). The causes appear to be multiple, including whiteband disease amongst *Acropora* since 1972, and the loss of herbivores through extreme overfishing (Woodley *et al.* 2002 p. 266). Extensive dieback of the sea urchin *Diadema antillarum* (an estimated 97 percent loss since 1972), the result of disease, contributed significantly to this transition to algae-dominated surfaces because *Diadema* is a herbivore (Buddemeier *et al.* 2004 p. 25). Hurricanes are also implicated; corals take relatively long to recruit and cover large areas, so algae and some encrusting invertebrates can more rapidly colonise disturbed space (Sebens 1994). Other bacterial diseases have caused significant coral mortality and sewage pollution is considered a contributing factor in places (Woodley *et al.* 2002 p. 266; Buddemeier *et al.* 2004).

Efforts to Understand the State of Reefs Worldwide

INITIAL EFFORTS TO THINK GLOBALLY ABOUT CORAL REEF DEGRADATION

Around the mid-1980s, as scientific concern about the scale of anthropogenic effects on coral reefs worldwide grew more acute, the need for more systematic data sets distinguishing anthropogenic effects from natural trends began to be recognised internationally. At the Fifth International Coral Reef Symposium in 1985, Arthur Dahl of UNEP (formerly of the South Pacific Commission (SPC)) contended that human-induced stress on reefs was global in scope and catastrophic in nature (Dahl c.1985). He described Okinawan and Tongan reefs as 80 percent and 65 percent damaged respectively (Grigg and Dollar 1990 p. 448).

INTRODUCING THE PLAYERS: 2. UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

After the 1972 Stockholm Conference on the Environment, the UN General Assembly created UNEP to act as a focus of environmental activities within the UN, and as a clearing house for environmental data and research. Unusually for a UN agency, it has no statute, charter or convention describing its function. That role is furnished by UNGA resolution 2997 (XXVII) which, amongst other matters, recognises the connection between development and environment. Based in Nairobi, Kenya, UNEP has taken a lead role in coordinating international negotiations (e.g. on ozone depletion, biodiversity and desertification). It provides secretarial support for several conventions including CITES and the CBD, and runs the Global Environmental Monitoring System. In the mid 1970s, UNEP launched a regional seas programme, which now has 140 participating states. The programme is based around twelve regional action plans that UNEP co-ordinates, bar the South Pacific one for which SPREP is responsible. In 2000, UNEP established a Coral Reef Unit under Arthur Dahl, to lead the UN's coral reef action and to manage UNEP's participation in the International Coral Reef Action Network (ICRAN). Initially based in Nairobi, the unit moved to Cambridge (UK) in 2003, joining ICRAN and WCMC. The US government funds much of UNEP's coral reef work.

Source: Imber (1993); UNEP (2001b p. 4; 2002b); International Coral Reef Action Network (2003 p. 8)

The IUCN Monitoring Centre (later to become the World Conservation Monitoring Centre, WCMC) subsequently published a three volume *Coral Reefs of the World* in collaboration with UNEP, examining coral reef management worldwide (UNEP and IUCN 1988). Using multiple information sources, including scientific papers, navigational charts, and personal communications, the authors of *Coral Reefs of the World* documented human impacts on reefs in 108 countries and reported on the types of information available and on management being undertaken, focusing on marine protected areas in particular (UNEP and IUCN 1988; Wells and Jenkins 1988). This publication was the first international attempt to come to grips with the state of reefs worldwide.

INTRODUCING THE PLAYERS: 3. WORLD CONSERVATION MONITORING CENTRE (WCMC)

Established in Cambridge, UK in 1983, the IUCN Conservation Monitoring Centre was reformatted in 1988 as an independent, non-profit entity, jointly funded by IUCN, UNEP and WWF-International. In 2000, with the full support of IUCN and WWF as well as the political and financial backing of the UK government, it became part of UNEP and was renamed UNEP-WCMC. A scientific advisory council guides WCMC's work, which entails: (1) assessing the status, value and management of biological diversity in various ecosystems; (2) publishing material and addressing enquiries about biological diversity, and (3) providing capacity building and information management for various conventions and organisations, acting as a clearing house so agencies can share data and information. Wherever possible, WCMC places its data in the public domain. WCMC manages CITES' database of export and import statistics, which it used in 1999 to produce a report on the global trade in corals. In 2001, it published the *World Atlas of Coral Reefs*.

Source: web site at www.unep-wcmc.org; Green and Shirley (1999); Spalding *et al.* (2001)

THE CATALYST EFFECT OF THE CORAL BLEACHING PHENOMENON

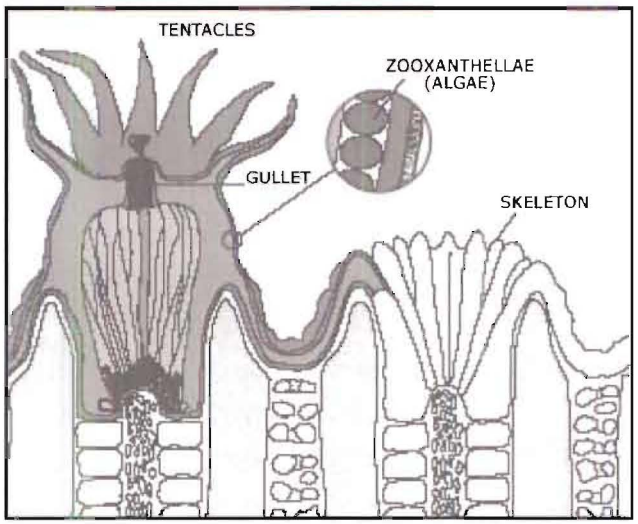
Observations of bleaching

Reports of coral bleaching in the late 1980s stimulated further efforts to assess the state of reefs worldwide. Reports of bleaching in the eastern Pacific, Panama and the Great Barrier Reef had first appeared in the marine science literature in the early 1980s (Glynn 1983; Harriot 1985). A handful of studies subsequently showed that zooxanthallae in corals were sensitive to even small temperature changes, leading to bleaching (Figure 2). The wave of bleaching in the late 1980s coincided with rising concern in the US about global climate change. At US Congressional hearings in 1990, environmentalists portrayed reefs as fragile sentinels warning of the dire consequences of global warming (a metaphor revisited in Chapter Eight).

By the early 1990s scientists had established retrospectively that bleaching had been reported elsewhere in the past: three mass bleaching events between 1876 and 1979 plus, in 1979-80, four areas

in the Pacific and two in the Caribbean (Coffroth *et al.* 1990; Glynn 1991 p. 176). Further bleaching and mass coral mortality in the early 1990s in regions of interest to US scientists (mainly the Caribbean-Bahamas and eastern Pacific) resulted in some of those scientists raising the possibility that this was a worldwide phenomenon related to climate change (Williams and Bunkley-Williams 1990; Glynn 1991; Brown and Ogden 1993; Glynn 1993 p. 496; Goreau and Hayes 1994). Several marine biologists suggested that ocean warming would lead ultimately to the loss of many reef communities (Pennisi 1997).

FIGURE 2: CORAL, ZOOXANTHELLAE AND BLEACHING



The phenomenon of coral bleaching occurs in corals, related cnidarians and some molluscs (e.g. giant clams) when they lose their algal symbionts (photosynthetic microalgae called zooxanthellae) and/or their pigments, in response to environmental stresses. It causes a loss of colour—corals first fluoresce then turn white. Zooxanthellae may leave their hosts either temporarily or permanently; if they return corals may recover.

Sources: Glynn (1996); Fitt (2001 p. 51); Buddemeier *et al.* (2004 p. 3)

Within coral communities, the degree of bleaching within and among coral colonies and across reef communities is highly variable and difficult to quantify, thus complicating co nparisons of different bleaching events (Glynn 1996 p. 495). The effects can, however, be dramatic:

> Debilitating effects of bleaching include reduced/no skeletal growth and reproductive activity, and a lowered capacity to shed sediments, [and] resist invasions of competing species and diseases. Severe and prolonged bleaching can cause partial to total colony death, resulting in diminished reef growth, the transformation of reef-building communities to alternate, non-reef-building community types, bioerosion, and ultimately the disappearance of reef structures (Glynn 1996 p. 495).

Around the same time that scientists began to associate this phenomenon with increased sea temperatures, the newly-created Intergovernmental Panel on Climate Change (IPCC) started investigating the likely impact of global warming and sea-level rise on various ecosystems including coral reefs (Pernetta *et al.* 1994; Cicin-Sain and Knecht 1998). In late 1991, UNEP, the Intergovernmental Oceanic Commission (IOC) of the United Nations Scientific and Educational

Organisation (UNESCO), WMO and the IUCN collaborated in assembling a group of experts to plan long-term global monitoring of climate change on coastal areas, coral reefs included (International Oceanographic Commission (IOC) 1992; Pernetta *et al.* 1994). This was despite the fact that a few months earlier, reef researchers at a US workshop in Miami in 1991, sponsored by the National Science Foundation, the National Oceanographic and Atmospheric Administration (NOAA) and the Environmental Protection Agency, had concluded that the gradual warming expected in the coming years was the least of their worries (Pennisi 1997). Most were concerned that by the time that reefs had to cope with global warming, those reefs would be dead—from pollution, destructive fishing, and more immediate threats. This was also the conclusion of the IOC/WMO/IUCN assembly of experts. Deciding that climate change was not an immediate threat to reefs, they stressed that coral reefs were, however, being seriously and increasingly stressed by exploitation and anthropogenic environmental changes such as sedimentation, nutrient loading and pollution, physical destruction and overfishing (Hulm and Pernetta 1993; Wilkinson and Buddemeier 1994 p. viii). "Reef communities are not well adapted to the combination of chronic and acute human (anthropogenic) stress and climate change; and their short-term survival is threatened by these stresses acting together" (Wilkinson and Buddemeier 1994 p. ix).

Establishing the Global Coral Reef Monitoring Network and ReefBase

In 1992 UNESCO-IOC proposed a worldwide network to assess and monitor coral reefs, envisaging it as part of a joint UNEP-IOC-WMO long-term global monitoring programmes designed to monitor coastal and nearshore phenomena related to climate change. This proposal lapsed when funding was not immediately available, but was revived in 1995 after ICRI had been formed (Wilkinson and Buddemeier 1994 p. vi). IOC, UNEP, and IUCN decided to co-sponsor the initiative, labelled the Global Coral Reef Monitoring Network, GCRMN for short (Global Coral Reef Monitoring Network 1997). Other sponsors joined later (see Chapter Seven, which describes ICRI's formation).

In the time between GCRMN being first proposed and set up, a global database of coral reefs was created to facilitate monitoring of coral reef health and support reef management (Oliver and Noordeloos 2002). Named ReefBase, this database was the initiative of the International Centre for Living Aquatic Resources Management (ICLARM), based in Manila. The Commission of the European Union, the Government of the Netherlands and USAID helped fund the database development, and ICLARM developed it in collaboration with WCMC. When GCRMN finally got underway, ReefBase became its official database (Oliver and Noordeloos 2002). ReefBase operates at www.reefbase.org.

In assessing the state of coral reefs worldwide, GCRMN gathers information from the organisations that comprise its regional (supra-national) and national nodes (initially 14, now 17). Some of these are older monitoring programmes and activities drawn into the GCRM network when it was established in 1995. The organisations running the nodes are responsible for training participants, monitoring, data analysis and reporting; they are expected to find their own operational funding, the global coordinator sometimes helping with funding applications (Global Coral Reef Monitoring Network 1997, 2003).

INTRODUCING THE PLAYERS: 4. GLOBAL CORAL REEF MONITORING NETWORK (GCRMN)

An informal international network operating through 17 independent nodes co-ordinated through a small office in Townsville Australia, GCRMN gathers information about the state of coral reefs in around 80 countries. It is run by a management group comprising representatives of its sponsors: IUCN, UNESCO-IOC, UNEP, WMO, AIMS, WorldFish Centre, World Bank, Convention on Biological Diversity and the ICRI Secretariat. The IUCN chairs the group and provides it with direction, a role IOC undertook until recently. The global coordinator Clive Wilkinson acts as editor for the biennial GCRMN global status reports and for manuals on monitoring reefs (both biological and socio-economic). Wilkinson also publicises the network at international forums. GCRMN's global coordination is largely funded by the US government (the US Department of State, NOAA and US Coral Reef Task Force (USCRTF), the latter described in Chapter Six), these funds being channelled through UNEP (previously through UNESCO-IOC). Funding for publication of global status reports and other manuals, plus some regional activities, is sourced from a variety of donors. GCRMN is closely linked with other organisations interested in coral reef monitoring and data collection including Reef Check and the WorldFish Centre which runs ReefBase, used by GCRMN as its global database. GCRMN contributes data to two global observing systems run by IOC and FAO (the Coastal Zone Module of the Global Ocean Observing System (GOOS) and the Global Terrestrial Observing System (GTOS).

Source: Global Coral Reef Monitoring Network (1997); Wilkinson (1998; 2000; 2002; 2004); Global Coral Reef Monitoring Network (2000); GCRMN report in International Coral Reef Initiative (2004)

INTRODUCING THE PLAYERS: 5. THE WORLDFISH CENTRE

An autonomous, nonprofit organisation, ICLARM was set up in 1977. Since establishing ReefBase in 1993, it has been renamed the WorldFish Centre and has moved its headquarters from Manila to Penang, Malaysia. Governed by an international board of trustees, the centre's work is funded by grants from private foundations and governments. In 1992, the Centre became one of the CGIAR research centres, introduced in Chapter Two. Members of that informal association share the mission of increasing food security and eradicating poverty in developing countries through research, partnership, capacity building, and policy support. Initially the WorldFish Centre specialised in fisheries research but it has broadened this to cover aquatic resource conservation generally, including policy issues. Besides its headquarters, the WorldFish Centre has offices in 12 countries, including two in the South Pacific (New Caledonia and Solomon Islands). Its funding comes mainly from European and North American governments, the European Commission, and from international organisations such as the World Bank. Total income in 2002 was USD 12.6 million.

Source: web site at www.worldfishcenter.org/objgov.htm; WorldFish Centre (2003)

INITIAL EFFORTS TO ASSESS THE EXTENT OF THE PROBLEM

In 1992, Clive Wilkinson (now global coordinator of GCRMN but then a scientist at the Australian Institute of Marine Science (AIMS)), made the first attempt to quantitatively assess the state (health) of coral reefs worldwide. This helped coalesce growing concern about coral reefs. In a paper delivered at the 7th International Coral Reef Symposium at Guam in 1992, Wilkinson estimated that 10 percent of the world's coral reefs were degraded beyond recognition and predicted that 30 percent were in such a critical state that they would be lost in the next 10 to 20 years followed by a further 30 percent in 20 to 40 years (Wilkinson 1992 p. 11, 16, 19). Wilkinson predicted that the 60 percent of coral reefs he categorised as either critical or threatened would effectively collapse in around two decades if no actions were taken and human populations along tropical coastlines continued to skyrocket—a dire scenario indeed.

Wilkinson based his estimates primarily on data and anecdotes from Southeast Asia (Birkeland quoted in Pennisi 1997). Shortly afterwards, 122 scientists from 22 countries examining the health of coral reefs worldwide at another University of Miami workshop concluded that there was insufficient information to form a more complete picture of the status of the world's reefs; the database for checking on the health of coral reefs was spotty and not easily comparable (Reef Check 2002). They agreed with Wilkinson's figures generally, concluding that, while most areas of remote reefs had not been studied, many nearshore reefs adjacent to or near urban population centres were suffering significant ecological decline. Echoing the judgment of the earlier Miami workshop and the UNEP-IOC-WMO group of experts, they considered the principal causes of degradation to be anthropogenic: overfishing, eutrophication, and sedimentation. Natural causes were thought to contribute as well: hurricanes, high sea surface temperatures associated with El Niño, diseases and imbalances in key predators (crown-of-thorns starfish, sea urchins) (Grigg and Birkeland 1997). The meeting espoused the need for a comprehensive assessment of coral reefs worldwide, to evaluate existing impacts (Grigg and Birkeland 1997).

The seriousness of the perceived state of coral reefs worldwide was again highlighted at an inaugural ICRI workshop in Dumaguete in 1995 (discussed in Chapter Seven). The *Call to Action* resulting from this workshop recognised that the decline in coral reefs was likely to lead to the loss of most of the world's coral reef resources during the next century. It too identified human activity as a primary agent of degradation, and affirmed that population growth would lead to increased pollution and increased uses of coral resources, accelerating the decline in coral reef ecosystems.

Late 1990s: Heightened Concerns

SYSTEMATIC ASSESSMENTS OF THE EXTENT OF DEGRADATION

The first GCRMN and Reef Check global reports

In the late 1990s, two different approaches to assessing the extent of coral reef degradation worldwide evolved: (1) GCRMN state of the reef reports assembled by professionals in countries with coral reefs (four reports over seven years, viz. Wilkinson 1998, 2000, 2002, 2004); and (2) Reef Check, which

used data collected by volunteer divers (Hodgson and Liebeler 2002). In addition, the World Resources Institute (WRI) co-ordinated an exercise assessing the extent of risks to reefs worldwide, called *Reefs at Risk* (Bryant *et al.* 1998). These three attempts are discussed below, Reef Check's in the following text box.

INTRODUCING THE PLAYERS: 6. REEF CHECK

The coral reef scientists who had assembled at the University of Miami in June 1993 felt that part of the difficulty in assessing the global state of coral reefs was due to the inefficient and inappropriate monitoring methods scientists were using. These methods were designed to investigate community ecology and measured many parameters that might not be affected when coral reef health is damaged. The scientists felt that methods should be designed specifically to investigate human impacts on coral reefs. They recognised another problem with the scientific approach: there are only a small number of reef scientists, most busy and only able to carry out surveys occasionally. As a result a group of researchers led by Gregor Hodgson developed a protocol for a global survey of the health of the world's reefs, carried out annually with volunteer help from non-scientists. This was trialled in 1996; in 1997 Reef Check teams completed the first global survey of coral reefs. Since 1996, over 5000 people have trained in Reef Check methods.

Reef Check objectives are to: educate the public about the coral reef crisis; create a global network of volunteer teams monitoring reef health; facilitate collaboration that produces ecologically sound and economically sustainable solutions; and to stimulate local community action to protect remaining pristine reefs and rehabilitate damaged reefs worldwide. Initially run out of the University of Hong Kong then University of California at Los Angeles, where founder Hodgson was based, Reef Check became an independent NGO in 2004. Governance is provided by a Board; it also has an Advisory Board, membership of both reflecting its links to various US-based businesses. Reef Check relies on grants from US philanthropic foundations, corporate sponsorships, UNEP and US government aid grants, discounted services, and help-in-kind from a wide range of source, to funds its global projects. By 2004 it was active in over 60 countries and territories, with 198 volunteer coordinators and scientists, and a core staff of four in Los Angeles.

Source: web site at www.reefcheck.org; Reef Check (2002); Keine (2004); Jenny Mihaly, Reef Headquarters, Pacific Palisades CA, *pers. comm.*

The first of the GCRMN global status reports, produced in 1998, was based on papers presented at a session of the 8th International Coral Reef Symposium in Panama in 1996. Wilkinson subsequently edited these papers, arranging for some to be updated, in order present the state of knowledge on the ecological conditions of coral reefs worldwide (Wilkinson 1998 p. vii). While this report did not contain any new quantitative assessments (over and above his 1992 analysis), it did note unprecedented

bleaching of hard and soft corals throughout the coral reefs of the world from mid-1997 to late-1998, when a widespread episode of coral bleaching coincided with severe El Niño and La Niña events and the severe climate swings those caused. Even remote reefs previously considered pristine were damaged, particularly in the Indian Ocean (Wilkinson 1999 p. 868). By the end of 1998, scientists had recognised that the coral bleaching episodes, and subsequent coral mortality, of 1997-1998 were the most geographically widespread ever recorded and probably the most severe in recorded history (Convention on Biological Diversity 1999 p. 25).

In the GCRMN global status report, Wilkinson categorised the severity of bleaching at places: some had suffered catastrophic effects with near 95 percent mortality of shallow corals (Bahrain, Maldives, Sri Lanka, Singapore, large areas of Tanzania) and severe effects in others (50-70 percent mortality, but also coral recovery in Kenya, Seychelles, Japan, Thailand, Vietnam and Belize). Many other areas had little or no bleaching (Wilkinson 1998 p. 11). In the report, Wilkinson (1998 p. 6) observed that:

> Recent reports from the Global Coral Reef Monitoring Network (GCRMN), Reef Check and many other projects indicate that coral reefs are under considerable stress and are experiencing considerable damage (Wilkinson 1998 p. 5). Increases in human populations and economic activity in the tropics over the past 50 years have resulted in increasing pressures on adjacent reefs.

Reefs at Risk

In 1998, another exercise emphasised the degradation of coral reefs worldwide, not by monitoring them but by assessing the comparative risks facing reefs in different regions. In this, WRI collaborated with the WorldFish Centre and UNEP-WCMC to produce the *Reefs at Risk* report (Bryant *et al.* 1998). UNEP, The Bay Foundation, The David & Lucy Packard Foundation, The Henry Foundation, the Swedish International Development Cooperation Agency, and the United States Environmental Protection Agency all supported the analysis (Bryant *et al.* 1998 p. 4). *Reefs at Risk* was a global assessment of four separate factors threatening coral reefs: coastal development, marine-based pollution, overexploitation of marine resources, and inland pollution including sedimentation. To predict where reef degradation is likely to occur, based on presumed human pressures on those areas, analysts used proxies to reflect likely threats, based on 14 data sets as well as maps of land cover, ports, settlements, and shipping lanes, plus information from 800 sites known to be degraded by people, and some input from reef scientists. The results indicate the level of threats to coral reef ecosystems in different regions; they are not a measure of actual condition or actual degradation (Bryant *et al.* 1998 p. 7). The authors acknowledged that they did not assess all known threats to coral reefs, omitting damage due to coral bleaching and crown of thorns starfish, for instance (Bryant *et al.* 1998 p. 51).

The results classified reefs in particular areas as being overall under either:

1. high threat—if at least one of the individual threat factors were classified as under high threat overall
2. medium threat—at least one of the individual threat factors were classified as under medium threat overall (and none of high threat)
3. low threat—if all four threat factors were of low threat (see Bryant *et al.* 1998 p. 47-50).

The report concluded that globally, 36 percent of all reefs were threatened by overexploitation, 30 percent by coastal development, 22 percent by inland pollution and erosion, and 12 percent by marine pollution. When these threats are combined, this suggested that 58 percent of the world's reefs may be at risk (under medium and high threat) (Bryant *et al.* 1998 p. 20). From this, the authors (Bryant *et al.* 1998 p. 21) concluded that that 27 percent of the world's existing reefs by area were under immediate threat of significant damage and a further 31 percent under a medium level of risk—similar to Wilkinson's conclusion described on the previous page.

INTRODUCING THE PLAYERS: 7. WORLD RESOURCES INSTITUTE (WRI)

World Resources Institute describes itself as an environmental think tank that goes beyond research to find practical ways to protect the earth and improve people's lives. It is an independent non-profit organization with a staff of more than 100, based in Washington DC and governed by a board of directors mostly from the US. WRI explores issues at the intersection of environmental protection and economic development, being mainly concerned with protecting Earth's living systems, increasing access to information, reversing global warming, and harnessing markets and enterprise to expand economic opportunity and protect the environment. In 2002, WRI received over USD 25 million in revenue, 35 percent from private foundations, 13 percent from the US government and the reminder from a mix of other sources. WRI provides information and practical proposals for policy and institutional change designed to foster (in its own words) environmentally sound, socially equitable development. In this it claims to collaborate with nearly 400 partners in more than 50 countries. WRI has been influential in American environmentalism, its reports serving as the basis of some American legislation and policy. An WRI study first proposed the Global Environment Facility; WRI studies have been used as the basis for many negotiations on ozone depletion, climate change and biodiversity.

Source: web site at www.wri.org; Jamison (1996 p. 231)

CORAL BLEACHING AND CLIMATE CHANGE

By the late 1990s, the list of anthropogenic impacts facing coral reefs had become a long one (Table 7). But it also appeared that reefs might be facing not just a series of local anthropogenic impacts but a truly global threat associated with global warming. Since initial concerns about coral bleaching in the early 1990s, several reef researchers had questioned the possible link between regional-scale bleaching of corals, high sea surface temperatures, increased greenhouse gases and climate change (e.g. Glynn 1993, as reported in Hughes *et al.* 2003 p. 929).

> Small-scale bleaching events can often be correlated with specific disturbances (e.g. extreme low/high temperatures, low/high solar irradiance, subaerial exposure, sedimentation, freshwater dilution, contaminants, and diseases), whereas large scale (mass) bleaching occurs over 100s to 1000s of km^2 is more difficult to explain (Glynn 1996 p. 495).

Shortly after 1997-98 bleaching episode, Kleypas *et al.* (1999) published a model which showed that increasing concentrations of carbon dioxide would dissolve in the sea and would threaten reefs by causing chemical imbalances in seawater, reducing coral calcification. With this renewed attention on the potential for global climate change to devastate coral reefs came dire predictions about the immediate future of coral reefs (e.g. Hoegh-Guldberg 1999; Wilkinson 1999) and Buddemeier (1999 quoted in Wilkinson 2000). Kleypas *et al.* (1999 p. 118) predicted that between preindustrial times and the middle of the next century, biogenic calcification in the oceans will drop between 14 and 30 percent; this would mainly affect coral reefs. Moreover, although the link has not been proven, the mass coral bleaching that occurred in most parts of the tropical world in 1997-98 and again in 2001-02 (described in Wilkinson 1998, 2000) seemed to resolve the doubts many coral reef scientists had about its causes. Some scientists declared the evidence for the detrimental effects of climate change on coral reefs to be incontrovertible (e.g. Hoegh-Guldberg 1999).

This was supported by predictions made in the Third Assessment Report of the IPCC in 2001. IPCC Working Group II, in an extensive review of evidence about global climate change, concluded that there were several causes associated with episodes of coral bleaching over the past twenty years, one being increased ocean temperatures. The Working Group authors predicted that coral reef ecosystems will be impacted by sea-level rise, warming sea surface temperatures and any changes in storm frequency and intensity.

> Future sea surface warming will cause stress on coral reefs and result in increased frequency of marine diseases (high confidence). Changes in ocean chemistry resulting from higher CO_2 levels may have a negative impact on coral reef development and health (Manning and Nobry 2001 p. 35).

In the same vein, a recent scientific review of the potential contributions of climate change to stresses on coral reef ecosystems concluded that there seems to be 'no realistic doubt' that continued climate change will cause further degradation of coral reef communities, which will be even more devastating in combination with the continuing non-climate stresses that will almost certainly increase in magnitude and frequency (Buddemeier *et al.* 2004 p. iv). The authors noted that stresses associated with climate change include high-temperature episodes promoting coral bleaching, reduced calcification, changes in ocean and atmospheric circulation, and rising sea levels, and they suggested these may exacerbate other stresses not directly related to climate, such as disease and predation (Buddemeier *et al.* 2004 p. iv).

TABLE 7: TYPES OF HUMAN ACTIVITIES ACKNOWLEDGED AS CAUSING CORAL REEF DEGRADATION

DIRECT PHYSICAL DESTRUCTION TO REEFS

Channel blasting and dredging

Coral mining and excavation for cement production and for coral sand; materials for building construction and road beds; coral for septic tanks

Shoreline projects eg sea walls, piers, reclamations, other coastal modification including roading

War and military activities including weapons and nuclear testing and wrecked craft

Removal of live rock for export for aquaria

Destructive fishing: explosives and poisons

Boat anchors and ship groundings

Nets dragged on reefs (mainly fine mesh ones)

Trampling: fishermen and tourists walking over shallow reefs

Careless and accidental damage from divers (fin kicks and kneeling)

HARVESTING, FISHING, AND INTRODUCTION OF ALIEN SPECIES

Depletion of targeted species including high value species, large fish, shellfish for food or export

Depletion of coral and exotic species for aquariums, curios, ornaments and jewellery

Spearfishing removing large fish

Tourists buying coral reef products unaware of the damage that the trade is causing

Fishing of spawning grounds reducing recruitment below critical levels

Indiscriminate depletion through blast fishing and poisoning

Accidental and purposeful introductions of alien species

DEGRADATION THROUGH ACTIVITIES THAT CHANGE WATER QUALITY AND TEMPERATURE

High temperature outfalls eg power plant effluents

Ship-based sources of pollutants

- Bilge water and ballast water
- Oil spills and hydrocarbons and the detergents used to clean them up

Land-based sources of pollutants and sedimentation

- Industrial discharges, oil spills, dumping, stormwater discharges (chemicals & heavy metals)
- Agrochemical and nutrient runoff from farms and golf courses (e.g. herbicides and pesticides)
- Discharge of poorly treated human or livestock sewage
- Siltation and sedimentation from logging, deforestation, slash and burn agriculture, mining, mangrove clearance, harbour dredging, construction, dumping of sand for beaches, indiscriminate land clearance

GREENHOUSE GAS EMISSIONS (GLOBAL WARMING)

Sources: Birkeland (1977); Salvat (1980); Veron (1986); Greenpeace Pacific Campaign (c 1989); Craik *et al.* (1990); Thresher (1991); Sorokin (1993); Weber (1993); Sebens (1994); Hodgson (1996); Hinrichson (1997); Mulvaney (1997); Wilkinson (1998; 2000); Chadwick (1999); Hoegh-Guldberg (1999); Tickell (1999); Denecke (2001); Economist.com Global Agenda (2001); James (2001); Buddemeier *et al.* (2004)

OVERFISHING AND DESTRUCTIVE FISHING METHODS

Just as fears about the effects of climate change on reefs escalated to a global scale in the late 1990s, so too did concerns about the overfishing of reefs and the effects of various international trades—in corals, ornamental fish and invertebrates, live rock, reef fish collected live for sale in Chinese restaurants, and the long-standing trade in bêche-de-mer. This heightened concern came at a time when fishery policymakers were trying to address the vast increase in global production from marine capture fisheries during the last half century, which has led to over-exploitation of important fish stocks, and modifications of ecosystems, significant economic losses, as well as international conflict (FAO 1995 p. v, 1; 1996 p. 1). From about 19 million tonnes of catch in 1950, world production has increased to about 80 million tonnes annually since the mid-1980s (FAO 2002 p. 8 of Part I)[1]. At WSSD in August 2002, national and regional representatives decided to take steps to restore fish stocks by 2015 (Cole 2003 p. 80).

Fisheries are the most extensive extractive use of living coral reefs, and fishing activities, both commercial and recreation, and are considered a key factor in worldwide decline in coral reef ecosystems (M^{c}Clanahan *et al.* 2002 p. 6). Many scientific papers and popular articles about coral reefs describe how fishing, whether for domestic use or for export, or in association with tourism, is depleting reefs (e.g. Birkeland 1977; Greenpeace Pacific Campaign c.1989; Craik *et al.* 1990; Weber 1993; Hodgson 1996; Hinrichson 1997; Mulvaney 1997; Ledua and Vuki 1998; Chadwick 1999; Tickell 1999; Denecke 2001; Economist.com Global Agenda 2001; James 2001). Some mention how fishing is depleting high value species, large fish, and shellfish, and live coral and exotic species for aquariums, curios, ornaments and jewellery. Others mention how tourists buy coral reef products, unaware of the damage that this trade is causing. Yet others mention how fishermen use explosives and poisons that cause indiscriminate depletion and destroy reef habitat (summarised in Table 7 above).

Concern about international trade

Although there is some concern about local overfishing through subsistence and artisanal fisheries, it is the level of international trade in coral, reef fish, live rock, and other reef organisms that is believed to be contributing to a general decline in coral reefs (Trade subgroup of the United States Coral Reef Task Force 2000; Lieberman and Field 2001 p. 19). There are several sub-trades in various types of organisms, each for different purposes and each with its own demand and supply dynamics.

One such trade is that in curios. Although many types of marine animals besides corals are collected, including conchs, snails, clams, starfish, seahorses, fishes, sea fans, sea whips, sand dollars and sea urchins, there is little data available on this trade (Trade subgroup of the United States Coral Reef Task Force 2000 p. 12). More is known about the trades in live coral and marine ornamentals, which burgeoned after advances in the technology of tropical marine aquaria. Development of self-contained

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[1] World fisheries are estimated to have changed from being an estimated 60 percent unexploited in the immediate post-war period to being 60 percent either fully or over-exploited by the early 1990s (FAO 1997). Expanding sea food markets, open access fisheries, technological innovations, government subsidy programmes and the opportunities created by the legal regime agreed in the 1982 United Nations Convention on the Law of the Sea (UNCLOS) are all considered contributing factors (Hanna 1999 p. 46).

'mini-reef' systems, complete with adequate lighting and bio-filtration to maintain a colourful range of corals, fish, invertebrates and algae, spawned a huge increase in tropical marine aquaria in private homes in North America, Europe, Japan, Taiwan and Australia (Holthus 2001 p. 17). Collectors select small pieces of coral, keep them alive in tanks, then air freight them to their destination (Lovell and Tumuri 1999; Trade subgroup of the United States Coral Reef Task Force 2000 p. 12). They may also grow these on, exporting second generation pieces.

These technological advances also spurred a huge increase in demand for live rock, which provides biofiltration in home aquaria and it gives a three-dimensional look (Lovell 2001 p. 10). Collected in small pieces from the edges of reef flats and patches of reef, live rock is a composite of skeletal material of algal or coral origin covered with coralline algae; it often has small plants and animals attached (Lovell 2001 p. 10). In 1997, ninety percent of world live rock exports came from the Fiji Islands and Tonga, and almost all went to the US (Trade subgroup of the United States Coral Reef Task Force 2000 p. 25). CITES treats live rock as coral, restricting its trade in the manner of species listed in Appendix II of that convention. In the late 1990s, a WCMC publication (Green and Shirley 1999, compiled from CITES data) spurred international debate when it highlighted how global trade in live corals and live rock trade had expanded over the past five years.

In total, over 1000 different species of reef organisms, including around 300 species of marine invertebrate, are being traded internationally for this industry, almost all taken from reefs rather than being cultured (Trade subgroup of the United States Coral Reef Task Force 2000 p. ii, 7). As well as the hundreds of thousand of kilograms of corals and live rock traded internationally each year, an estimated 15 to 20 million coral reef fishes (possibly far more) are traded for use in home aquaria. Actual catches may be far higher because of significant mortality (Sadovy and Vincent 2002). The data on the total quantities of fish exported in this trade is unreliable, although the volume does seem to be steadily increasing (Holthus 2001 p. 17). The trade's annual retail value in the 1990s was estimated at somewhere between USD 90 and USD 300 million (Sadovy and Vincent 2002 p. 400).

Around 80 countries export marine aquarium fish. By far the largest suppliers of marine aquarium fish worldwide are Indonesia and the Philippines (Holthus 2001). Significant numbers also come from Australia, Hawaii and Florida, and the greater Caribbean (Sadovy and Vincent 2002 p. 396-397). In the Pacific, the trade is growing (Chapter Twelve). Worldwide, over 1000 fish species from 50 families are traded. Most of the species traded are from just seven families (angelfish Pomacanthidae; wrasses Labridae; damselfishes Pomacentridae; surgeonfishes Acanthuridae; butterfly fishes Chaetodontidae; gobies Gobiidae; and groupers Serranidae) (Sadovy and Vincent 2002 p. 394). Most of the fish sought are small, often juveniles, sought for attractive colour and physical shape; when males are more brightly coloured (as with some wrasses) they are preferred over females. Hobbyists often pay high prices for rare fish (Sadovy and Vincent 2002 p. 395).

The trade in live reef fish for food also concerns reef scientists and environmentalists. Live fishes are in high demand in Asian restaurants where diners select their meal from a display tank (Sadovy and Vincent 2002 p. 391). Hong Kong imports most of these fish, re-exporting considerable volumes to other parts of Asia. There is also a growing market amongst Chinese communities in Australia and the

US west coast (Sadovy and Vincent 2002 p. 396). Originally based on a small supply from the South China Sea, the trade grew significantly in 1980s when Indonesia and Philippines became suppliers, then expanded further into the Indo-Pacific in the 1990s (PINA Nuis Online 2002; Sadovy and Vincent 2002 p. 395-396). Fish are now sourced from more than 20 countries in the Asia-Pacific region, including Australia and various Pacific Islands (Muldoon *et al.* 2005 p. 35 and see Chapter Twelve following). Accurate statistics of the trade's size are not collected; best guesses suggest it is in the order of 30,000 to 50,000 tonne per year (Sadovy and Vincent 2002 p. 399-400; Muldoon *et al.* 2005).

The trade is susceptible to the economic environment in Asia and both prices and volumes traded have declined since the late 1990s, but appear to have since stabilised (Muldoon *et al.* 2005 p. 35-36). A recent estimate placed the retail value of trade into Hong Kong at around USD 350 million (Muldoon *et al.* 2005 p. 35). This stabilisation is not the full story however. One study has estimated that demand for live reef fish exceeds sustainable production in the Indo-Pacific and Southeast Asia by 2.5 to six times (Warren-Rhodes *et al.* 2003 p. 481). Hong Kong, southern China, Taiwan, Singapore, and Malaysia consume more seafood taken from coral reefs than can be sustainably generated, and are thus depleting reefs in a widening semi-circle extending into Oceania, where reefs are being targeted increasingly (Warren-Rhodes *et al.* 2003 p. 484). Since 1995, volumes being exported from Oceania have risen rapidly (Johannes and Riepen 1995; Gillett 2002 p. 18; PINA Nuis Online 2002).

Another of the concerns about this live reef food fish trade is the threat it poses to several targeted species—large, relatively slow reproducing groupers and wrasses such as the humphead wrasse *Cheilinus undulatus*, along with snappers (family Lutjanidae). While only a few species are sought, they are sought in high volumes; consumers value rarity and prefer certain sizes and colours especially red (Sadovy and Vincent 2002 p. 393). Moreover, there is high mortality during holding and transport, and probably around twice as many fish are caught as successfully traded and consumed (Sadovy and Vincent 2002 p. 400). The practice of fishing aggregations of spawning fish adds to the risk of extinction. Because fishers move from one area to another, as fish numbers drop too low to be worth the effort to catch, there is also the risk of serial depletion. Some fishers are known to have targeted remote, otherwise pristine reefs. Because the trade is in live fish, these can be caught and stored in cages or tanks until sufficient are collected to justify arranging transport. This allows remote communities to participate; in some locations ships with built-in tanks periodically visit such communities to buy suitable fish.

The use of cyanide and of explosives in the live fish capture for the ornamental and food trades is also of concern because these practices damage reefs (TRAFFIC 1999). Use of fishing methods that are physically destroying coral reefs (drag nets as well as explosives and poisons), is believed to have become common, particularly in Southeast Asia, because fishers find these methods more profitable and competitive than traditional hook and lines, set nets, and traps (McClanahan 2002 p. 464). One biologist has estimated that roughly a square metre of reef is destroyed for every live reef fish caught with cyanide (Pearce 2003). Such disturbance may change the type of reef (i.e. the dominant species). According to an article in *New Scientist*, in the Philippines cyanide fishing has turned many biologically diverse reefs on the planet into marine deserts (Pearce 2003). These practices have

attracted the attention of several NGOs, mostly North American such as the one described in the box below.

INTRODUCING THE ACTORS: 8. INTERNATIONAL MARINELIFE ALLIANCE (IMA)

A NGO founded in the US in 1985, IMA focused on exposing and combating the widespread use of cyanide to capture live reef fish in the Philippines. Working with WRI and TV media outlets, it documented the spread of cyanide fishing and associated problems with this trade—and IMA's approach in the Philippines—in a series of publications and television documentaries. Subsequently deluged by requests for information and assistance from government fisheries and environment agencies, donor groups and other NGOs throughout Asia-Pacific, IMA collaborated with WRI, launching in 1998 a regional initiative to reform destructive fishers.

Charles Barber of the Philippines' WRI office helped IMA raise over USD 3 million funding in only two years, much of it from the East Asia and Pacific Environment Initiative, a USAID and State Department partnership. Barber subsequently joined IMA in 2001 as Vice President and Washington DC representative. The Packard Foundation, MacArthur Foundation, The Nature Conservancy, and WWF also contributed funds to its programmes. Expanding rapidly between 1998 and 2001, IMA established field programs in Indonesia, Fiji Islands (see Chapter Twelve), Hong Kong, Marshall Islands, Vanuatu and Vietnam and a regional research programme at the University of Guam. Then as quickly as it had risen, IMA contracted. Paying high salaries to US senior staff and employing hundreds of workers in Southeast Asia, it was relying on further US funding applications. In the aftermath of September 11 (2001), when funding for marine conservation became difficult to obtain. IMA scaled down its field offices and programmes.

Sources: IMA web site at www.marine.org/Philippines/AboutIMA.html ; Barber's biography on web site http://biodiversityeconomics.org/business/020831-03.htm; EAPEI web site at http://eapei.home.att.net/; Ken MacKay, C-SPODP coordinator, Suva, *pers. comm.*.

There are also concerns about the international bêche-de-mer fishery, which dates back hundreds, possibly thousands of years. This multi-species fishery has largely been unmanaged, even though production has escalated in the last fifteen years, partly as a result of the liberalisation of trade with China, the main market (Preston 1997 p. 20). The fishery has several environmental side effects. Some sea cucumber species play an important role in recycling marine sediments; if too many are removed, areas can turn into a type of marine desert (Warwick Nash, WorldFish Centre, *pers. comm.*). Smoking the sea cucumbers is often done using mangrove wood from areas close to fishing grounds and this has caused extensive mangrove destruction in some places. The waste water from boiling bêche-de-mer is toxic to marine life including corals, if disposed of in the sea as often happens (Preston 1997 p. 20).

LOSS OF BIODIVERSITY ON CORAL REEFS

Since the CBD was created in 1992, the loss of biological diversity in various ecosystems has become an international concern, due largely to the work of international conservation NGOs and the IUCN. Attention has focused on coral reef ecosystems because of their high biodiversity of both species and genes (see text box on the following page). Of all the planet's seas, highest biodiversity exists in 'the coral triangle' encompassing reefs around northern Australia, Indonesia, the Philippines and Papua New Guinea, to which the Solomon Islands were recently added. Since 2000, conservation NGOs identifying biodiversity 'hotspots', areas with large numbers of species and/or many endemic species have concentrated on reefs in this triangle. Around 25 hotspots are now recognised, most are in tropical regions with their species-rich rainforests and reefs (Society for Conservation Biology 2003). As a result of Conservation International (CI) surveys in 2001 and 2004, the two spots vying for the greatest marine diversity are in Irian Jaya and the Solomon Islands (*pers. obs.*, 10th ICRS).

INTRODUCING THE PLAYERS: 9. CONVENTION ON BIOLOGICAL DIVERSITY (CBD))

Signed by 150 government leaders at the 1992 Earth Summit, this convention entered in force in late 1993. It is dedicated to promoting sustainable development but is largely silent about marine biodiversity. Nevertheless the CBD became interested in coral reefs in 1998 when severe bleaching in the Indian Ocean prompted some delegates to raise this topic at the fourth CoP. The CoP requested its Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA) (mandated to provide advice on all aspects of the Convention's work) to analyse the bleaching phenomenon and report back. It also instructed the Executive Secretary to express its concern to the Framework Convention on Climate Change (UNFCCC) and the Convention on Wetlands. SBSTTA subsequently decided that, in addition to coral bleaching, physical degradation and destruction of coral reefs posed a significant threat to the biological diversity of coral reef ecosystems and asked the CoP to expand its sphere of interest accordingly.

Source: web site www.biodiv.org; Secretariat of the Convention on Biological Diversity (1999); Subsidiary Body on Scientific Technical and Technological Advice (1999); ENB (1999)

Since biodiversity became a popular notion in the early 1990s, concerns about overfishing of reefs and practices that destroy reef habitat have expanded to include concerns about biodiversity loss. Organisms considered under threat include turtles, some of the larger fish species (the bumphead parrot fish *Bolbometopon muricatum*, humphead wrasse, and some groupers), sea horses, and several large, sessile molluscs, particularly green snails, giant clams and trochus. There is also concern that some coral species extremely sensitive to bleaching may be lost (McClanahan 2002 p. 475). Naturally-rare coral species sought by the aquarium trade are also attracting conservationists' attention (Doug Fenner, Department of Marine and Wildlife Resources, American Samoa, presentation at IUCN side event, *Initiative on Extinction in the Sea*, June 29 2004 at 10th ICRS, Okinawa).

THE BIODIVERSITY OF CORAL REEFS

The long separation of evolutionary pathway among marine lineages—many extant marine animal phyla originated or diversified during the Cambrian era more than 500 million years ago but plants and animals only invaded land in the Paleozoic, 200-400 million years ago—has resulted in a greater variety of body plans, greater functional and chemical diversity, and greater 'endemism' in major groups of marine compared to terrestrial animals (Reaka-Kudla 1997 p. 86). Coral reefs are particularly diverse, their structural foundation supporting so many species they have been portrayed as oases of biodiversity and biomass in an oceanic desert (Done *et al.* 1996 p. 417). The most depauperate reef is likely to be more diverse and structurally complex than any adjoining benthic community (Done *et al.* 1996 p. 396). Yet, researchers are just beginning to understand reef diversity, processes, and the basic biology of corals themselves (Sebens 1994 p. 116).

No comprehensive biodiversity inventories covering all coral reef taxa have been made but it seems likely this is extremely high (Reaka-Kudla 1997 p. 87-88). Although total coral reef species diversity has been difficult to quantify, it seems that thousands of species are yet to be recognised and described (Sebens 1994 p. 117; Reaka-Kudla 1997 p. 89-91). Most visible on reefs are the sessile epibenthic organisms that provide its complex structure (hard, and soft corals, sponges, coralline and fleshy algae) and the suprabenthic reef fishes, the latter one of the most diverse vertebrate assemblages on the planet. Yet much of the diversity and biomass of coral communities is in cyptofauna—animals that bore into the substrate (e.g. sponges, polychaete and sipunculan worms, and bivalves), sessile encrusters living within holes and crevices (e.g. bryozoans, sponges, tunicates, polychaete worms) and motile nestlers inhabiting those (e.g. polychaete and sipunculan worms, echinoderms, molluscs, and crustaceans (Reaka-Kudla 1997 p. 87).

On biogeographic scales, reefs exhibit huge differences in species composition and diversity. Coral diversity is highest around insular Southeast Asia and it is much lower in the Atlantic than in the Indo-Pacific—there is one-tenth the number of Scleractinian corals in the Atlantic than in the Indo-Pacific region. Another major diversity gradient occurs moving away from high diversity centres, one in the Pacific, one in the Red Sea and one in the Philippines, New Guinea and surrounding area (Sebens 1994 p. 116). Coral diversity declines eastward across the Pacific Ocean as do reef fish (Sebens 1994 p. 116). There are close to 900 species in the western Pacific but only half that number in the eastern Pacific and a third in the Atlantic (Thresher 1991). Other reef fauna follow this diversity gradient (Sebens 1994 p. 116). Along the western shores of the Americas and West Africa, coral diversity and reef development is very restricted (Spalding *et al.* 2001 p. 19-21). The diversity of corals and reef-associated species also declines north and south of the equator, diminishing fairly rapidly along latitudinal clines; high latitude reefs are dominated by a few species able to survive periodic winter chills (Sebens 1994 p. 116; Spalding *et al.* 2001 p. 19).

A Worldwide Crisis

RECOGNITION OF A WORLDWIDE CRISIS FOR CORAL REEFS

During the 1990s that idea that coral reefs are undergoing a crisis worldwide gradually gained credence, coalesced by several assessments of the state of coral reefs worldwide. Table 8, below, lists the various pronouncements mentioned in this chapter. By 2000, some were saying that it was now too late to save the coral reefs of the planet even if greenhouse gas emissions could begin to drop immediately (UNESCAP 2000). By 2001, the idea that coral reefs were in crisis was both widely accepted amongst coral reef researchers, and was shaping the work agenda of policy organisations and NGOs. Several recent authoritative scientific publications contemplating the future of coral reefs and their vulnerability to environmental change have emphasised the inescapability of the crisis, including Hoegh-Guldberg (1999), Knowlton (2001), McClanahan (2002), Hughes (2003), and Buddemeier (2004). By mid-2004 the coral reef crisis was an accepted part of scientific papers in both *Science* and *Nature* journals and in articles in the *New Scientist* magazine.

TABLE 8: SITES OF KEY PRONOUNCEMENTS ON THE GLOBAL STATE OF CORAL REEFS

Year	Assessment
1985	*A gamble on the future* (Dahl c.1985)
1988	*Coral Reefs of the World* (UNEP and IUCN 1988)
1991	Miami workshop sponsored by Sea Grant (D'Elia *et al.* 1991)
1992	Wilkinson (1992) at 7th ICRS in Guam
1993	Miami workshop on *Global Health of Coral Reefs* (Ginsburg 1993)
1994	UNEP-IOC-ASPEI-IUCN Global Task Force on Coral Reefs (Wilkinson and Buddemeier 1994)
1995	Jameson *et al.* (1995) for ICRI workshop
1998	First GCRMN global status report (Wilkinson 1998) *Reefs at Risk* assessment (Bryant *et al.* 1998)
1999	*Climate change, coral bleaching and the future of the world's coral reefs* (Hoegh-Guldberg 1999)
2000	Second GCRMN global status report (Wilkinson 2000)
2002	Third GCRMN global status report (Wilkinson 2002) Reef Check five-year report (Hodgson and Liebeler 2002)
2003	*Global trajectories of the long-term decline of coral reef ecosystems* (Pandolfi *et al.* 2003) *Climate change, human impacts and the resilience of coral reefs* (Hughes *et al.* 2003)
2004	*Coral Reefs and Global Climate Change* (Buddemeier *et al.* 2004) Fourth GCRMN global status report (Wilkinson 2004)

In a retrospective analysis of records dating back thousands of years, a group of researchers concluded that "Coral reefs have declined over the course of human history, culminating in the dramatic increase in coral mortality and reef degradation of the past 20-50 years" (Pandolfi *et al.* 2003). The rapid changes over the past three decades are believed to be on such a large scale that few regions still have 'pristine' reefs (Jackson 1997). The causes of the current crisis are considered to be a complex mixture of direct-human imposed and climate related stresses. Many human influences are implicated in these recent changes in reef ecology, which encompass changes to water temperatures, seawater chemistry (toxic substances, nutrients, the effects of atmospheric carbon dioxide levels on reef-building activity), removal of species, and food web alterations. Also implicated are outbreaks of disease which have suspected but unproven connections with both human activities and climatic factors (Buddemeier *et al.* 2004 p. 4). Diseases are of concern to coral reef scientists as they appear to be increasing; in the Caribbean (and perhaps globally) a combination of warm waters and disease are believed to having devastating effects on coral reefs (McClanahan 2002).

GCRMN AND REEF CHECK GLOBAL STATUS REPORTS

Both Reef Check and GCRMN continue to monitor the state of reef health worldwide. Between 1997 and 2001, Reef Check volunteers monitored over 1500 reefs in the Atlantic, Indo-Pacific and Red Sea, in 50 countries and territories. In 2001, staff at Reef Check headquarters analysed data from 1107 sites, examining spatial and temporal changes in indicator abundance, plus correlations between abundance and ratings of human impact (Hodgson and Liebeler 2002 p. 7). Only some of their data was sufficient to allow conclusions, which showed that high value fish and shellfish have been fished out in some areas; four species of fish are critically endangered: Nassau grouper; barramundi cod, bumphead parrotfish, and humphead wrasse (Hodgson and Liebeler 2002).

Through the GCRMN global status reports, Wilkinson has continued his efforts to quantify the extent of coral reef degradation. In the second global report in 2000, in which 97 contributors prepared a total 86 reports on countries/ states, collated by region, Wilkinson sought to quantify the proportion of reefs destroyed in the 1997-98 bleaching, and those still under various degrees of threat. He asked the coordinators to examine the predictions that he had made in 1992 and to update those for their region (Wilkinson 2000 p. 17-18). From their responses he compiled a table (on page 18 of Wilkinson 2000). The data from that table (which included predictions from the *Reefs at Risk* analysis) is reproduced in the first three rows of data in Table 9 below, along with figures from an update Wilkinson prepared for the 2004 global status report.

In the 2000 report, Wilkinson suggested that many of the reefs reported 'lost' in 1998 (estimated at 16 percent) would recover " except possibly for those in already stressed areas... there are likely to be major changes in the composition of coral communities and reduction in harvestable products" (Wilkinson 2000 p. 19). In the 2004 global status report, Wilkinson estimated that 40 percent of the reefs damaged in 1998 had recovered (based on figures provided for each region by experts). "Many coral reefs continue to recover...the recovery is not uniform and many virtually destroyed in 1998 show minimal signs of recovery (Wilkinson 2004 p. 8-9).

TABLE 9: GRCMN QUANTITATIVE GLOBAL ASSESSMENTS OF THE STATE OF CORAL REEFS

Analysis	*Estimated percentage of coral reefs worldwide:*		
	Destroyed	**Facing high risk**	**Facing medium risk**
1992 Guam	10%	30%	30%
1998 *Reefs at Risk*	--	27%	31%
GCRMN 2000	11% lost due to human causes plus 16% not fully functioning after the 1998 bleaching	14%	18%
GCRMN 2004	20 %	24 %	26 %

Sources: Wilkinson (1992; 2000; 2004), Bryant *et al.* (1998)

Wilkinson (2004 p. 8) concluded that: "Current predictions are that the extreme events of 1998 will become more common in the next 50 years i.e. massive global bleaching mortality will not be a 1/1000 year event in future, but a regular event". He has continued to argue that reefs classed as either critical or threatened would be irreparably degraded unless the stresses are removed and relatively large areas are set aside as marine protected areas.

CONCLUSION

This account of concerns about coral reefs has identified a multitude of problems threatening coral reefs. In each decade since the 1960s, new environmental problems have emerged, as shown in Table 10 overleaf, adding to the suite already being faced. Increasing scientific knowledge about coral reefs, through scuba, better mapping, monitoring of meteorological parameters and of reefs themselves, along with research into symptoms of diseases and coral bleaching have all raised new concerns about their health and long-term viability as ecosystems. As coral reefs have been linked to successive environmental agendas, new techniques for assessing the state of reefs worldwide have emerged, along with means of diffusing the information these produce, this creating the basis for a co-ordinated response to the perceived crisis.

This, then, is the orthodox view of the role of science in identifying coral reef problems. In the next chapter I reinterpret this role, by studying how the crisis has been discursively constructed and its message disseminated. In doing so, I revisit Wilkinson's contentions about the fragility of coral reefs, and analyse conceptual changes in his thinking, reflected in the extracts quoted above.

TABLE 10: TIMELINE OF KEY INTERNATIONAL CORAL REEF CONCERNS AND POLICY RESPONSES

Decade	Key Concerns of the Decade	Policy Responses (see Chapter 7)
1960s	**Crown-of-thorn starfish outbreaks, Australia and the Pacific** **Recovery after 'natural' events**	Scientific meetings including: • 1st International Coral Reef Symposium • IBP coral reef theme • PSA coral reef symposia
1970s	**Further outbreaks of crown-of-thorn starfish in Pacific and Indian Oceans** **Fishing and shell collection** **Direct extraction of coral** **Various sources of pollution** **Nuclear detonations in the Pacific**	CITES listing of black corals
1980s	**An expanding list of anthropogenic effects** **Decline in coral cover in the Caribbean: shift to algae-dominated reefs** **Sudden death syndrome amongst fish in home aquaria linked to cyanide used in collecting fish** **A wave of coral bleaching in the late 1980s prompts searches for historical records of previous bleaching events**	International Coral Reef Society formed CITES listing of hard corals UNEP and IUCN publish *Coral Reefs of the World*
1990s	**Anthropogenic effects** **1997/98: unprecedented bleaching associated with El Niño/ La Niña events; building on earlier debate about the potential effects of climate change, concern about the effects of widespread coral bleaching deepens** **New and expanding international trades in reef organisms** **Extensive destructive fishing in Southeast Asia** **Continued decline in Caribbean corals and recognition of the role played in this by microbial diseases**	GCRMN conceived ReefBase set up ICRI formed and *Call to Action* formulated Reef Check started US Coral Reef Taskforce established World Bank/ GEF reef conservation projects CDB workplans on coral reefs WRI *Reefs at Risk* analysis MAC's certification scheme for the marine ornamentals industry initiated CITES focus on the global coral trade Large environmental NGOs start campaigns
2000s (first half)	**Further widespread coral bleaching events** **Anthropogenic effects** **Overfishing and destructive fishing practices** **Recognition of the role that increasing international trade plays in worldwide reef decline** **Continued concern about unprecedented coral bleaching; consideration given to how best to mitigate coral bleaching and aid reef resilience** **Possible species extinctions and loss of biodiversity in the Caribbean and elsewhere**	ICRAN and ICRIN set up UNEP's Coral Reef Unit World Bank/GEF research project on bleaching Ramsar and WHO interest in protecting reefs Species Survival Commission assessments IUCN global coral reef portfolio established Development of global standards for the LRRFT Further campaigns of environmental NGOs Partnership established to develop tools for encouraging reef resilience

Chapter Six

The Crisis Narrative

Introduction

This chapter moves from an orthodox reading to an alternative (counter-) reading of the environmental problems prompting international coral reef policy, examining how scientists have discursively constructed and disseminated a narrative espousing a state of worldwide crisis facing coral reefs. In doing so, it elucidates some of the practices of science/policy, showing how ideas about 'the state of the environment' can come into good currency despite a weak basis in systematic quantitative research, and describing how these ideas circulate and recirculate, in self-reinforcing ways, through coral reef science, international policy reports, speeches at major events, and the media.

The Shape of the Crisis Narrative

A simple narrative analysis shows that the notion of a coral reef crisis takes the form of a narrative argument. The core message is that coral reefs are in serious decline globally, facing possible extinction. Both climate change and 'non-climate stresses' from human activities are implicated, 'continuing non-climate stresses' will 'almost certainly increase in magnitude and frequency', their impact on reefs exacerbated by the stresses associated with climate change (Buddemeier *et al.* 2004 p. iv, quoted in the previous chapter). Reefs already stressed will be irreparably degraded unless the stresses are removed and relatively large areas are set aside as marine protected areas (Wilkinson 2000 p. 18).

The timing of the demise of coral reefs is still uncertain. Some commentators, including Greenpeace quoted in Chapter One, predict demise within 100 years. ICRI's *Call to Action* states "If allowed to continue, this decline is likely to lead to the loss of most of the world's reef resources during the next century" (International Coral Reef Initiative 1995). Wilkinson, in the 2000 GCRMN global status report (2000 p. 19) predicted that:

> Coral reefs will not become extinct in the immediate future, but there are likely to be major changes in the composition of coral communities and reductions in harvestable products... Reefs will probably recover somewhat from the current bouts of anthropogenic and climate change degradation, but it is likely that worse is yet to come and we will probably experience significant reductions in the cover and health of coral reefs, and major losses of biodiversity.

The main actors of this story are the reefs themselves, the people charged with managing coastal areas (whether in communities, local government, or national government), the coral reef science community, the ICRI network and NGOs interested in saving coral reefs, and the human populations in developing countries where the majority of reefs occur. Some are the villains causing the demise of reefs and some their saviours, as examined in Chapter Eight.

The narrative has moral implications: everyone who has some say in managing reef areas will be at fault if they let this happen. Therefore, they must all follow the prescriptions put forward by coral reef science community, gathered together in the statements made in ICRI's *Call to Action* and *Framework for Action* and the renewed *Call for Action* made at the International Tropical Marine Ecosystems Management Symposium (ITMEMS) in 1998 (all discussed in the next chapter). For if coral reefs were to become extinct, their 'ecosystem services' would be lost to millions of people who depend upon them, net potential benefits currently estimated at USD 30 billion per year (Cesar *et al.* 2003). Their extinction would imperil the lives of millions of people who rely on reefs for food and income. This shows how coral reefs are being valued because of their use to humankind.

How the Crisis Narrative has been Constructed

TRACING THE POLICY IMPACT OF GLOBAL CORAL REEF ASSESSMENTS

This section describes how this narrative has been discursively constructed, referring back to the efforts to assess the global state of coral reefs described in the previous chapter: Wilkinson's initial attempt in 1992, recurrent GCRMN global reporting exercises that he later co-ordinated, Reef Check's efforts using volunteer divers, plus WRI's risk assessment of reefs. It is possible to gauge the influence of these assessments by tracing the way they have been quoted in the international media and in policy documents of international environmental agencies. Here, I cite examples of how the figures Wilkinson presented in his 1992 paper concerning the extent of reefs degraded worldwide have been reproduced, and I illustrate where figures from the *Reefs at Risk* assessment have been quoted. I follow this with further examples showing how, when Wilkinson revised his assessments in the 2000 global status reports, those revisions were also quoted in authoritative sources. This exercise identifies three things: how these assessments have been ongoing sources of data about the state of reefs; how they have contributed to the construction of the crisis narrative; and how policy processes use this data.

METHODOLOGY: TRACING THE ROUTES TAKEN BY DATA

In September 2002 I systematically searched likely sources for any such statements in both media reports and in documents produced by intergovernmental agencies concerned with the environment. When I found statements about the state of coral reefs, or predictions about their dire future, I then attempted to trace the origins of those back to the various assessments that had been made. Close similarity in wording and in percentages quoted provided a clue as to a source of testimony, requiring detective work similar to the detection of plagiarism (the latter described in BonJour 2002 p. 187).

For news items about the state of coral reefs, I searched Environmental News Network (ENN), BBC News Online, and Economist.com, authoritative agencies reporting environmental stories online. Looking for policy papers, I searched web sites of international organisations concerned with reefs, plus the CBD's (meeting agendas and reports). With the Internet search engine Google, I searched the web for material relating to coral reef activities at WSSD. Treating the Union of International Associations (UIA) databases as authoritative summaries of information about international organisations, I sought entries about coral reefs. Subsequently, until the 2004 GCRMN global status report was published, I searched sporadically for further policy documents, meeting reports or articles quoting one or other of the earlier global assessments. In doing so, I noted the idea of a coral reef crisis was strengthening rather than waning. These searches produced articles containing quotes that can be traced back to Wilkinson's 1992 paper, the GCRMN status reports and WRI's *Reefs at Risk* report. Some are based upon single sources, some combine sources. Almost all are recent, since 1998. One should not, however, conclude that there had been little use made earlier of Wilkinson's 1992 paper; the sparsity of quotations from it may merely reflect the way older Internet sites are updated with more recent subject material.

Quotations based on Wilkinson's 1992 paper

Wilkinson's initial (1992) assessment has been quoted in authoritative policy documents reporting on coral reefs, and in 2000was still being quoted occasionally. The United States Coral Reef Task Force (USCRTF, introduced in a box below) quoted these figures in its action plan for all US reefs as justification that coral reefs are 'in peril'. Although the plan refers to several expert groups who over the past decade have exhaustively documented and evaluated the growing number of anthropogenic threats to coral reefs, Wilkinson's are the only figures used to justify this contention (United States Coral Reef Task Force 2000 p. 3):

> ...the value of coral reefs to the nation is matched only by their vulnerability to harmful environmental changes, particularly those resulting from human activities. Present estimates are that 10 percent of all coral reefs are degraded beyond recovery; 30 percent are in critical condition and may die within 10 to 20 years, particularly those near human populations; and, if current pressures continue unabated, another 30 percent may perish completely by 2050 (United States Coral Reef Task Force 2000 p. 3).

INTRODUCING THE PLAYERS: 10. US CORAL REEF TASK FORCE (USCRTF)

In 1998, the Year of the Ocean, the US government created a taskforce to oversee the stewardship of US coral reef systems. This arose from commitments which President Clinton made during the US's first National Ocean Conference. As well signing an executive order (13089) on coral reef protection, creating the taskforce, President Clinton successfully sought significant funding in his 2000 budget request to Congress for coral reef protection, management and restoration. The USCRTF is charged with reducing and mitigating coral reef degradation from pollution, over fishing and other causes, coordinating all mapping, monitoring, research and policy matters. Co-chaired by the Department of Commerce (the department responsible for NOAA) and the Department of Interior, it includes 12 federal agencies responsible for reef conservation, seven state and territorial partners, and three freely associated states (thus including Guam, Puerto Rico, American Samoa, Florida, Hawaii, Commonwealth of the Northern Mariana Islands, and the US Virgin Islands). The taskforce was formed not only to conserve reefs under US jurisdiction, but to support international efforts to conserve and sustainably use coral reefs. The Secretary of State and Administrator of the Agency for International Development, in cooperation with other members of the Task Force, are required to assess the US role in international trade and protection of coral reef species and implement appropriate strategies and actions to promote conservation and sustainable use of coral reef resources worldwide.

Source: Yozell (2001 p. 302); US Coral Reef Task Force (c.2004)

ICRI's *Call to Action* states that coral reefs are in serious decline globally (Chapter Five). Its wording draws (unattributed) on Wilkinson's 1992 assessment that ten percent of reefs worldwide were already degraded: "Coral reefs are in serious decline globally, especially those near shallow shelves and dense populations. It has been estimated that 10 percent of the earth's coral reefs have already been seriously degraded and a much greater percentage is threatened" (International Coral Reef Initiative 1995). The Executive Secretary of the CBD quoted Wilkinson's figures in a report he prepared for the CBD's Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA, introduced in the CBD box below): "By 1992, 10 percent of the world's reefs were lost, and 30 percent were in a critical state" (Executive Secretary, Convention on Biological Diversity 2000b).

These uses of Wilkinson's initial assessment by policy agencies have led to further, secondary reporting of them. For instance, an article about coral reefs posted on the SeaWeb web site reported that according to the IUCN (note, not Wilkinson himself), as much as 10 percent of the world's coral reefs have been degraded beyond recovery, and another 30 percent is likely to decline within the next 20 years. "Those at greatest risk are in South and South-east Asia, East Africa, and the Caribbean. Out of 109 countries in which reefs are known to occur, significant reef degradation has occurred in 93" (Mulvaney 1997).

Quotations based on the 1998 Reefs at Risk assessment

The 1998 *Reefs at Risk* report (Bryant *et al.* 1998) has also been quoted in authoritative policy forums and documents. UNEP (2002a) reported in a news release that UN Secretary-General Kofi Annan urged the WSSD in his "Towards a sustainable future" speech on 14 May 2002, to address the threats on coral reefs stating that "75 percent of marine fishes are fished to capacity and 60 percent of the coral reefs endangered".

In the same 2000 report to the CBD's SBSTTA quoted above, the Convention's Executive Secretary reported that the 1998 *Reefs at Risk* report suggested that 27 percent of the world's existing reefs were under immediate threat of significant damage [the WRI report actually said high threat] and a further 31 percent under a medium level of risk (Executive Secretary, Convention on Biological Diversity 2000b). Another SBSTTA report the same year stated that "Nearly 60 percent of the world's coral reefs are threatened by localised human activities that have the potential to exacerbate the impacts of coral bleaching events" (Subsidiary Body on Scientific Technical and Technological Advice 2000).

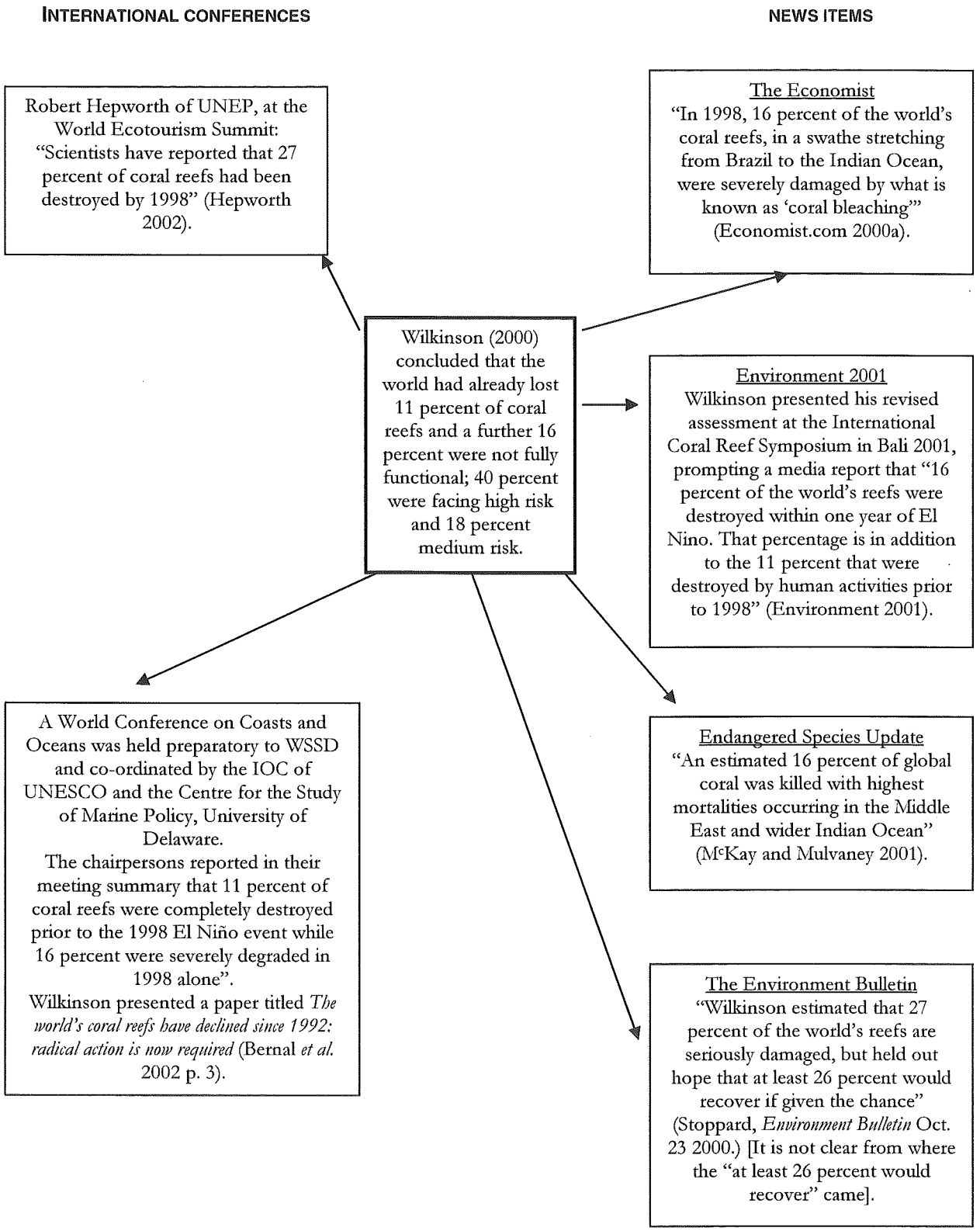
UNEP's 1999 report on the state of the environment in the Pacific, in its only Pacific-wide marine and coastal statistic, stated that "Fifty-nine per cent of reefs in the Pacific have been assessed as being at low risk, 31 per cent as being at medium risk and 10 per cent as being at high risk" (Miles 1999 p. 16). The Union of International Associations in its online databases on world issues stated that "Nearly 60 percent of the world's coral reefs are threatened by localised human activities that have the potential to exacerbate the impacts of coral-bleaching events" (Union of International Associations 2000a). The *World Atlas of Coral Reefs*, reporting on the *Reefs at Risk* exercise, stated "It was estimated that overall some 58 percent of the world's reefs were under medium to high threat" (Spalding et al. (2001). In a BBC news item, the atlas's lead author Mark Spalding (UNEP-WCMC) was reported as saying: "The reefs are degrading faster than data can be collected. An estimated 58 percent are under threat from human activities, whilst we have no idea how much has already gone" (Kirby 2001).

The *Reefs at Risk* assessment was also quoted in various media reports, sometimes indirectly and through secondary sources. For instance, the Environment Bulletin reported that: "Estimates of the amount of damage to the world's coral reefs vary. The World Wildlife Fund (WWF) describes 60 percent of the coral reefs in the world as in a degraded state" (Stoppard 2000). An Associated Press story stated that "nearly 60 percent of the earth's coral reefs are threatened by human activity" (James 2001).

Quotations based on the GCRMN 2000 status report: estimate of percent of reefs destroyed

In this 2000 status report, Wilkinson revised his estimate of the percentage of reefs destroyed or degraded (Chapter Five). These revisions were again widely quoted by UNEP and others, as illustrated in Figure 3 on the next page.

FIGURE 3: QUOTATIONS BASED ON THE GCRMN GLOBAL STATUS REPORT, 2000



Incorporation into international environmental agencies' work

It is clear, even from my online search concentrated in September 2002 and sporadically updated over another two years, that the few efforts to put quantitative figures on the state of reefs worldwide have provided material not only for scientific papers and news articles. They have provided material used in various conferences, speeches and policy documents. In effect, these efforts to assess the state of coral reefs worldwide, and the risk to them, have constructed a narrative—a thesis—of worldwide coral degradation that has achieved considerable visibility in the international environmental policy arena. The way that various texts quote the numerical assessments and predictions in these various global assessments confirms that the latter are major sources of the narrative.

The global assessments of coral reefs, principally the *Reefs at Risk* analysis and Wilkinson's various assessments, including the sections he wrote for the overviews of the biennial GCRMN global status reports, have prompted international policy agencies to adopt the notion that coral reefs are in crisis worldwide and to incorporate that notion into speeches and policy documents. The way the news media reported the crisis has also helped this happen. The global assessments have been quoted in both official documents and speeches from UNEP and the Secretariat of the CBD. For instance, a report that the Executive Secretary of the Convention prepared for SBSTTA 6 included this summary of the status of coral reefs:

> By 1992, 10 percent of the world's reefs were lost and 30 percent were in a critical state. The global 1998 *Reefs at Risk* analysis from the World Resources Institute suggested that 27 percent of the world's existing reefs were under immediate threat of significant damage and a further 31 percent under a medium risk (Executive Secretary, Subsidiary Body on Scientific, Technical and Technological Advice 2001 p. 13).

In fact, the second part of the statement (by 1992, 10 percent of the world's reefs were lost and 30 percent were in a critical state) derives from Wilkinson 1992 not the *Reefs at Risk* report. The report from the Secretariat of the CBD goes on to state:

> Assessments to late 2000 now indicate that 27 percent of the world's reefs have been effectively lost, with the single largest cause being the massive climate-related bleaching event of 1998. While there is a good chance that many of the 16 percent of damaged reefs will recover over time, some predict that half will never recover (Wilkinson 1998, 2000). The latest global predictions suggest that a further 14 percent of the world's coral reefs will be lost by 2010, and another 18 percent in the 20 years following (Wilkinson 2000), without reductions in the current human-induced stresses on reef systems from growing populations and economies. This means that 59 percent of the world's reefs are under immediate threat of loss within several decades (Executive Secretary, Convention on Biological Diversity 2000b p. 13).

This quotation illustrates how, in reproducing quantitative assessments, policy reports can reduce or ignore the degree of uncertainty attached to these. Wilkinson had put some riders on the revised assessment he produced in 2000; the Executive Secretary ignored these, and also converted into a certainty, the possibility that climatic factors caused widespread death of corals in 1998.

Clearly the quantitative figures in Wilkinson's assessments and in the *Reefs at Risk* report have made an impact on those at UNEP and in the Secretariat of the CBD, finding their way in many speeches and reports. For example, when the SBSTTA reported to the CoP fifth meeting, endorsing the results of the expert consultation on coral bleaching, that report contained the following statement: "Nearly 60 percent of the world's coral reefs are threatened by localised human activities that have the potential to exacerbate the impacts of coral bleaching events" (Subsidiary Body on Scientific Technical and Technological Advice 2000 p. 4). This derives from Wilkinson's assessments. Wilkinson's figures have also impacted on UNEP policy. At its twenty-first session, the governing council of UNEP adopted a resolution (21/12; 9 February 2001) on coral reefs. This included a statement to the effect that it supports cooperation with GCRMN "especially in light of the recently published report which presents the prospect that 60 percent of the world's coral reefs could be lost by 2030" (UNEP 2001a p. 48). The text box below shows the various organisations that support the message being disseminated in the GCRMN global status reports, by virtue of their top-level staff being part of that network's management group. These people added their signatures to the 2004 status report.

GCRMN MANAGEMENT GROUP ENDORSING 2004 GLOBAL CORAL REEF STATUS REPORT

Patricio Bernal, Executive Secretary, **Intergovernmental Oceanographic Commission, UNESCO**

Klaus Toepfer, Executive Director, **United Nations Environment Programme**

Carl Gustaf Lundin, Head, Global Marine Program, **IUCN – The World Conservation Union** (Chair)

Warren Evans, Director, Environment Department, **The World Bank**

Hamdallah Zedan, Executive Secretary, **Convention on Biological Diversity**

Ian Poiner, Director, **Australian Institute of Marine Science**

Stephen Hall, Director General, **WorldFish Center**

Rolph Payet, Seychelles, Co-Chair, **International Coral Reef Initiative Secretariat**

Source: Wilkinson (2004)

The prophetic nature of the narrative

Quantitative predictions that not only emphasise the risks that reefs face worldwide, but prophesise the demise of many, are a visible part of this crisis narrative. Both officials of international agencies and journalists have used the figures in the various global assessments to shape the predictions they reproduce in their reports and articles. For instance, in a report to SBSTTA, the Executive Secretary of the CBD interpreted Wilkinson's 2000 predictions to mean that:

> The latest global predictions suggest that a further 14 percent of the world's coral reefs will be lost by 2010, and another 18 percent in the 20 years following, without reductions in the current human-induced stresses on reef ecosystems from growing coastal populations and economies. This means that 59 percent of the world's reefs are under immediate loss within several decades (Executive Secretary of the Convention on Biological Diversity 2000b p. 13).

The Environment News Service reported that "The United Nations Environment Programme and the IUCN-World Conservation Union warn that coral reefs are less abundant than had previously been supposed. They estimate that 60 percent of coral reefs could disappear by 2030 without urgent action". (Environment News Service 2001)

Robert Hepworth of UNEP announced that "Scientists have reported that 27 percent of coral reefs had been destroyed by 1998 and that within another 30 years a further 32 percent are seriously threatened. The most accessible reefs are the most threatened" (Hepworth 2002).

Officials reporting an international coastal policy meeting in Paris in late 2002 wrote: "SIDS [small island developing states] have some of the world's largest reef areas, and have much larger shallow-water systems, such as sand banks, sea grass beds, and sponge beds at depths less than 100 metres. A combination of near-shore pollution and offshore over-harvesting, places the whole of this vast ecosystem at risk of collapsing" (Seoung-Yong and Goldstein 2002). "Another 20 to 30 percent are threatened in the next 10 years, while current projections indicate possible losses of 50 to 60 percent within 30 years" (Bernal *et al.* 2002 p. 3).

In its online databases, the Union of International Associations stated that "Scientists predict that more than 70 percent of all reefs will be destroyed in our lifetime" and (quoting Bryant *et al.* (1998) "More than half the world's reefs are potentially threatened by human activities, with up to 80 percent at risk in the most populated areas" (Union of International Associations 2000b, 2000c).

The BBC announced, in a side box of a news story on their web site titled *Poor prospects for Earth Summit* that "27 percent of coral reefs are thought to have been lost, with another 32 percent at risk by 2032" (Kirby 2002a).

The *Economist* reported (Economist.com Global Agenda 2001) that some scientists fear that it is already too late and that within 50 years most of the world's coral reefs will be dead—bleached to barren skeletons from the effects of global warming.

The Environmental News Network, an online service, reported that "Scientists say that if nothing changes, 40 percent of the world's reefs could be lost by 2010" (James 2001).

METHODOLOGY: TRACING THE ROUTES TAKEN BY THE CRISIS NARRATIVE

Having established the direct relationship between the various assessments of the global state of reefs and the crisis narrative found in media reports and international policy discourse, I then investigated how that crisis narrative has been produced. Not being able to find any published account of the methods that Clive Wilkinson had used, I asked him, by email, how he had derived his figures. From USP, I obtained copies of the directives Wilkinson had issued about the form the various regional reports should take. I also talked to those coordinating the GCRMN Southwest Pacific node. Finding virtually nothing in the literature analysing the reaction to Wilkinson's 1992 assessment, I discussed it with Ken Mackay, then C-SPODP coordinator in Suva, a man connected into many international marine science policy discourses in developing regions, who recalled criticisms made at the time. Observations I made at the 10th Coral Reef Symposium in Okinawa in 2004 also helped me understand the process by which the narrative being produced. I was able to observe authors, instructed by GCRMN coordinating staff to prepare national and regional reports to a standard format, delivering their results as papers and posters in sessions set aside specifically for this purpose (Chapter Eight explores further the effects of this standard formatting).

I traced the dissemination of the narrative through scientific papers. Having accumulated, over three years, a large pile of scientific papers on the condition and future of coral reefs and on such topics as the coral bleaching phenomenon, coral diseases, and the effects of fishing on reefs, I used these to trace the emergence and progress of the crisis narrative in this literature. I searched for papers which, in their introductions, established their context by describing how reefs are in crisis, in decline, or in some way under threat. I concentrated on papers written by scientists who had published widely on coral reefs—the big names in reef science—surmising that these would be widely read. In reading these, I noticed how scientists were quoting other scientists about the extent of reef degradation worldwide. Having already investigated the sources of those figures, I was then able to trace the origin of those quotations, just as I had traced it in news articles, popular accounts, and policy papers.

METHODS OF PRODUCING AND DISSEMINATING THE NARRATIVE

Wilkinson's methodology in producing quantitative assessments

A perusal of the methods Wilkinson used, a description of which has never been published, suggests that his work is science/policy rather than statistically rigorous, quantitatively-based scientific observation. Contrary to generally accepted standards for scientific publications, in his published papers he scarcely mentioned his methods of data collection (Wilkinson, confirmed to author by email, 11 June 2003). Being published as stand-alone policy documents, the GCRMN status reports were not subject to the scientific peer review that journal articles undergo. Nor was the 1992 conference paper; while Wilkinson used 'expert reports' to flesh out his own 'minimal data', many of those experts did not want to be quoted (Wilkinson, email to author, 11 June 2003). Their interpretations could not,

therefore, be critiqued by their peers. (The other part of Wilkinson's email is reproduced below, in the *A Call to Action* sub-section.)

Nevertheless there has been some scientific criticism of Wilkinson's methods, including the observation that Wilkinson had based this initial assessment (1992) on work primarily in Southeast Asia, mentioned in Chapter Five. It subsequently appeared that less than 10 percent of those reefs had been thoroughly explored (Birkeland quoted in Pennisi 1997). Another of the criticisms levelled at Wilkinson's 1992 estimates of coral reef degradation worldwide was that he took estimates of coral cover from Indonesian surveys, then assumed that dead coral or lack of coral cover corresponded to degradation, even though there is often considerable dead coral on healthy reefs (Ken Mackay, C-SPODP co-ordinator, Forum Secretariat, Suva, *pers. comm.* November 2003).

In the previous chapter I described how Wilkinson, in arriving at the figures in his 2000 GCRMN summary, asked all regional coordinators to fill out a table detailing for either their region as a whole or for individual countries: percentage of reef destroyed before 1998; destroyed in 1998; at a critical stage and likely to be lost in 2-10 years; and threatened and likely to be lost in 10-30 years. The only contributors to the 2000 status report that were prepared to permit figures in individual country reports to be used were those from South Asia, where the 1998 bleaching had impacted (Wilkinson, email to author, 11 June 2003; a matter not stated in the status report itself). From the information available to him in various contributors' reports, Wilkinson then estimated the extent of degradation for Arabian Ocean, Wider Indian Ocean, Australia and Papua New Guinea, South and East Asia, Wider Pacific Ocean, and the Caribbean Atlantic (Clive Wilkinson, *pers. comm.* by email, 11 June 2003). The figures for the wider Pacific Ocean would have been an amalgam of those from the southwest Pacific; southeast and central Pacific; American Samoa and Micronesia and other US-affiliated and freely associated islands; and Hawaii, originally prepared as four separate reports by four different sets of regional coordinators. Thus the figures that Wilkinson presented were guess-estimates, generalised to either a national or sub-regional level. To obtain global predictions he weighted these according to the reef areas calculated in Spalding *et al.* (2001) and provided to him prior to publication (Clive Wilkinson, *pers. comm.* by email 11 June 2003). In a note added to the table in the 2000 global status report, Wilkinson added that the losses in 1998 (which were losses estimated as arising from the major coral bleaching event that year) should be regarded as temporary as many of these reefs should recover, provided that major bleaching stresses are not repeated frequently. He gave no justification for this.

To obtain statistics to present at the Okinawa International Coral Reef Symposium and to include in the 2004 global status report, Wilkinson changed his approach to calculating the extent of coral degradation, directing all regional coordinators to use estimates of live coral cover, summarised to national level. However, in calculating the percentage of reefs destroyed and under various stages of threat (Table 11 in Chapter Five), this new approach entailed as much generalisation and guesswork as the previous method of estimating the percentage of reefs dead or dying. It did not prove any easier to estimate on a regional scale (Reuben Sulu and Caroline Vieux, Pacific GCRMN coordinators, *pers. comm.* July 2004).

Wilkinson seems to be of the opinion that, because the figures derived in the *Reefs at Risk* exercise were approximately the same as his own quantitative assessment, this in some way validated his calculations (Wilkinson, email to author, 11 June 2003). At the Okinawa International Coral Reef Symposium in 2004, he presented both a paper and poster containing a table quantifying the amount of reefs lost and predicted to be lost, which contained both GCRMN and *Reefs at Risk* statistics. This was despite the fact that the *Reefs at Risk* analysts estimated risk from various threats rather than attempting to assess actual condition (as described in Chapter Five).

This brief perusal indicates something of the nature and practices of the international field of science/policy as it applies to coral reefs. The way that other scientists have quoted Wilkinson, the global status reports and *Reefs at Risk*, further elucidates this.

Establishing the global crisis: scientists quoting other scientists

Several authoritative scientific papers and reports have used Wilkinson's figures to justify the notion that coral reefs are in crisis. Used in this way in the papers' introductions, they establish the extent of the crisis situation without having to describe any other scientific evidence for it. One example is a report from the Pew Centre for Global Climate Change (an American non-governmental scientific organisation funded by a charitable trust), concerning potential contributions of climate change to stresses on coral reefs; when published, the report's findings were summarised in the international media. In their introduction, the three authors, well-known in coral reef research circles, wrote that "By 1998, an estimated 11 percent of the world's coral reefs had been destroyed by human activity, and an additional 16 percent were extensively damaged in 1997-98 by coral bleaching", citing Wilkinson (2000, 2002). At no stage do the authors question how Wilkinson's figures were derived and whether they are accurate. The 17 authors of a report on climate change, human impacts, and the resilience of coral reefs published in the prestigious *Science* journal (Hughes *et al.* 2003) took the same approach. They began it by stating that coral reefs, although critically important for the ecosystems goods and services they provide, are in serious decline: "an estimated 30 percent are already severely damaged, and close to 60 percent may be lost by 2030", citing Wilkinson (2002). *Science*, its referees and editors was prepared to accept this quotation, giving it an added authority.

In a recent paper in *Nature* about regional gradients in biodiversity (Karlson *et al.* 2004 p. 869), one of the authors of this *Science* paper along with two other well-known coral reef researchers, justified the need for more ecological and biogeographical studies by stating that: "Recent assessments of the status of coral reefs verify that they are globally threatened and efforts to manage them will require international cooperation". In support of this they cited as evidence the same paper in *Science*.

The authors of several other recent scientific papers about the worldwide coral reef decline commence their papers in a similar vein, quoting other scientific publications supposedly providing evidence of this decline. For instance, in a review investigating whether nutrient enrichment is a major cause of coral reef decline, Szmant (2002) started her paper by writing:

> Coral reefs worldwide, and in particular in the Caribbean and southern Florida, are experiencing a recent period of decline. There has been a major loss of coral cover and diversity (Hoegh-Gulberg 1999; Wilkinson 2000) coupled in many areas with an increase in algal biomass and shift in algal community structure (McCook 1999).

One of the papers Szmant cites, the widely-cited Hoegh-Gulberg (1999), establishes the worldwide extent of the crisis by stating that "Dramatic reversals in their health have been reported from every part of the world. Between 50 percent and 70 percent of all coral reefs are under direct threat from human activities" quoting Goreau (1992), Wilkinson (1994), Sebens (1994), Bryant *et al.* (1998), and Wilkinson (1999). Only two of these cited references provide any such figures: Wilkinson 1999, which quotes both his 1992 figures and Bryant *et al.* 1998, the latter a map-based risk assessment rather than an estimate of actual extent of degradation (as described in Chapter Five). So in effect Hoegh-Gulberg is relying on Wilkinson's initial 'guesstimates', supplemented by pieces of information from other locales such as Jamaica (Goreau's work), although he does not clarify this.

The authors of the Pew Centre report on Global Climate Change, Buddemeier *et al.* (2004 p. 4-5) mentioned above, established the notion that coral reefs are in crisis with the following paragraph:

> Coral reefs have declined over the course of human history, culminating in the dramatic increase in coral mortality and reef degradation of the past 20-50 years (Pandolfi *et al.*, 2003). This 'coral reef crisis' is well documented and has stimulated publications on the future of coral reefs (e.g. Hoegh-Gulberg 1999; Knowlton 2001; McClanahan 2002) and their vulnerability to environmental change (e.g., Bryant at al., 1998; Hughes *et al.*, 2003). The causes of this crisis are a complex mixture of direct human-imposed and climate-related stresses, and include factors such as outbreaks of disease, which have suspected but unproven connections to both human activities and climate factors. By 1998, an estimated 11 percent of the world's reef had been destroyed by human activity, and an additionally 16 percent were extensively damaged in 1997-98 by coral bleaching (Wilkinson 2000, 2002). Widespread coral bleaching, unknown before the 1980s, has brought recognition that reefs are threatened by global-scale climate factors as well as by more localised threats, and that different types of stress may interact in complex ways.

Their citations refers to the same small group of papers as justification that the extent of the crisis is worldwide, the authors of those cited papers having in turn depended upon Wilkinson and the GCRMN work to establish the extent of the crisis. These estimates remain the only attempt to quantify the extent of damage worldwide; Reef Check data analysis concentrates on a few parameters rather than providing an overall assessment of reef condition or degradation. Thus, the authors of scientific papers who have cited authors other than Wilkinson as evidence of a decline in coral reefs worldwide, are in fact citing those who have already made these claims using Wilkinson's work as a base, rather than anybody who has substantiated the extent of the decline through alternative research. This is perhaps a case of believing that if they cite someone recognised as a coral reef expert, then the statement will be regarded as true, whatever the initial, or present, evidence for it.

Standards of scientific publishing require authors to cite the evidence for various statements by noting who first made the statements they quote. This allows readers to find and study the original work. This does not necessarily happen in practice however, it being too easy to merely copy citations from other papers without checking the original source. Thus scientific myths are perpetuated in spite of the scientific refereeing process. Original quotations may be misrepresented or their caveats overlooked.

Furthermore, citing other publications as sources is an ambivalent practice. One may be citing the author(s) who first presented certain evidence or observations; alternatively one may be citing other authors who had previously made the same claims as the author is now making; or one may be citing authors of reviews that come to that same conclusion. When the situation is ambiguous, as in the case of the citations I mention above, it seems the referees and editors are prepared to give the author the benefit of the doubt, contrary to strict scientific standards of publication.

Generalising the geographical extent of the crisis to a global scale

Not only has the crisis been discursively established though the practice of citations in published papers, it has also been established through the scientific practice of generalising geographical extent to the global. For example, in collating information about different locales and making an international overview, these exercises (Wilkinson's initial attempt, subsequent GCRMN exercises, the *Reefs at Risk* assessment and Reef Check) purport to cover all regions with reefs sufficient to present a global picture. This is reflected in the title of the GCRMN publications: "*Status of coral reefs of the world*". One of the criticisms of these works has been their particular regional bias, namely that they over-represent results from some areas and under-represent them from others—the way that Wilkinson's 1992 presentation relied heavily on data from Southeast Asia for example. Checking this, American scientist John Connell (1997), aware that popular accounts of the effects of disturbances on coral reefs are often anecdotal, attempted to double-check the conclusions being drawn about worldwide decline in coral reef health by surveying quantitative studies of coral reef abundance that were at least four years in duration. Reporting on his investigation at the 8th International Coral Reef Symposium, he explained how he had found only 65 samples in which sufficient data existed to make a judgement; of those 65 studies, 47 percent were from Western Atlantic reefs, which collectively form a relatively small proportion of reefs worldwide. Furthermore, a high proportion of the examples on which the statistics were based came from a very few heavily-studied reefs, over-representing them in the analysis (Connell 1997 p. 13). One has to presume also that there were certain biases in the way that reefs had originally been selected for study. Perhaps those most studied were easy to visit, being close to urban areas or research stations: it is generally accepted that reefs close to urban areas are likely to be more degraded than remote reefs away from dense human habitation or coastal agriculture (e.g. Zann 1994). Connell's analysis shows how biases are introduced when results from a few reefs or regions are generalised into a statement about the state of reefs worldwide. Too much emphasis is given to a small number of reefs, from regions that may not be representative of what is happening elsewhere. This is a criticism that also applies to assessments in the 1998, 2000, 2002 and 2004 GCRMN global status reports.

But Connell's analysis was not sufficient to destabilise the narrative of worldwide crisis, then developing, indicating another general feature of the field of coral reef science/policy—its tendency to generalise from accounts of degradation rather than accounts of a wide range of reef health status. Some recent scientific reports have, however, been more cautious in generalising the extent of reef degradation, noting for instance that in various regions, the level of damage to reefs is dissimilar (e.g.

Buddemeier *et al.* 2004 p. 28 who cite Connell 1997). Buddemeier *et al.* hedge their bets without backing away from the belief that the crisis is global in extent:

> Although this crisis is widespread, individual reefs and even whole regions exhibit considerable variation in both health and responses to stresses. The Caribbean region has been particularly hard-hit by problems (Gardner *et al.* 2003), many of which are well-studied. Caribbean case studies and inter-ocean contrasts help to illustrate both the consistencies and the variations in coral reef responses to complex environmental changes (Buddemeier *et al.* 2004 p. 5).

This practice of generalising problems geographically underlies the entire crisis narrative. Key scientific papers about the ecological problems facing coral reefs generalise from observations at specific locales to the universal, thus establishing the coral reef crisis as global in scope and extent. Yet, as I described in Chapter Five, many of the coral reef problems now depicted as international in scale were initially concerns concentrated in one particular region. In the Caribbean, the issue has been coral diseases, the die-off of coral species and the replacement of coral dominated reefs by algal-dominated ones. In Southeast Asia, particularly in the Philippines and Indonesia, the problem has been a combination of large numbers of fishers, heavy fishing pressure especially for export, use of destructive fishing practices, and local pollution which collectively stressed reefs. These concerns have been expanded into a universalised narrative emphasising the global nature of the crisis facing coral reefs. This narrative overlooks how reefs in different locales differ biogeographically, how they may have different human and natural histories and be on different trajectories.

There seems to be an assumption that all reefs will eventually end up in a degraded condition unless we do something to prevent this. In summarising regional observations Tim McClanahan, widely published in coral reef science and conservation especially about east Africa, concluded (2002 p. 474):

> The current trajectory is from localised small-scale disturbances such as fishing, river discharge and pollution towards regional and global-level disturbances associated with warm water, diseases and changes in seawater chemistry. There has also been a temporal pattern with regional-level ecological change occurring first in the Atlantic and eastern Pacific beginning in the early 1980s followed by the Indo-Pacific and Indian Oceans.

Mechanisms used by scientists to publicise the crisis

Amongst themselves, coral reef scientists have used further practices to perpetuate the notion that reefs are in worldwide decline. The International Coral Reef Symposium (Table Six in Chapter Five) has been a key forum for debating the future of coral reefs. So too has ITMEMS. Another method of publicising the coral reef crisis has been through ReefBase, the online information system that gathers available knowledge about coral reefs into one repository, also described in Chapter Five. ReefBase is organised in such a way that one can search for information documenting the status of reefs in various locations, or the threats to them. It provides summaries of this, as well as lists of references, many online. The attention generated by these and other initiatives have served to bring the crisis to the attention of the wider community interested in international environmental matters. The GCRMN and ICRI have been key mechanisms; UNESCO's Year of the Coral Reef in 1997 also assisted.

'Scientific' reports commissioned by think tanks and NGOs have also served a role. Key reports to have received international publicity include the Pew Centre's report on coral reefs and climate change (Buddemeier *et al.* 2004); Greenpeace's report on the effects of climate change on Pacific reefs (Hoegh-Guldberg *et al.* 2000); and *Reefs at Risk* (Bryant *et al.* 1998). These authors have used has used the same tactic of quoting other scientists to establish the authenticity of the crisis, as described above.

INTERNATIONAL CORAL REEF SYMPOSIA: DISSEMINATING THE MESSAGE

Coral reef scientists from around the world meet in large numbers only once every four years, at the International Coral Reef Symposia (Chapter Five). These symposia have grown so popular, that in Okinawa in 2004, people were limited to presenting one paper each in order to accommodate everyone's work. Held over five days, the symposium included plenary sessions with nine keynote presentations, and eight sessions of mini-symposia, during which up to 10 parallel sessions ran at one time, plus three sessions to show over 600 posters. Some of the most popular papers were the tales of catastrophe. Any expectation of a doom and gloom message delivered by a big name in international coral reef science and the room was packed, eg Jeremy Jackson's *Are coral reefs on a slippery slide to slime?* and Terry Done's *Coral Reefs in 2050 (pers. obs.).* Interestingly, neither of these presented new research. Jackson's presented work published in *Science* in 2001; Done's paper was a review of past work on how the effects of disturbance combine in shaping the quality of individual reefs.

The role of the media

The media, both mainstream news organisation and ones concentrating on environmental matters, have also disseminated the crisis narrative, as I showed in the first part of this chapter. GCRMN global status reports are being extensively quoted in media reports and policy documents. Although media reports treat this data as authoritative, they appear less interested in its accuracy.

In earlier examples cited from policy documents, speeches and news articles, it was possible to clearly identify the source of the data being quoted about the extent of damage to coral reefs—the actual figures used are recognisable as coming from one of the assessments prepared. This is not the case for several other news articles about coral reefs in which the authors have used multiple sources, mixing and matching their predictions. In the four examples cited below, I was unable to identify all the original sources of the figures, despite my considerable familiarity with coral reef literature. These examples show how for the news media, that while quantitative assessments of reef degradation make a good story, accuracy is not of paramount importance—at least not sufficient to directly and correctly attribute estimates of degradation to the original source. Journalists appear to have mixed their sources.

> Kirby (2002b) on BBC News Online: "...scientists who had published their finding in *Science* and reported them at the 2001 Bali International Coral Reef Symposium are reported as stating that "25 percent of the world's coral reefs have already been destroyed or badly damaged by problems arising from climate change. They say 58 percent of reefs are reported to be threatened by human activities".

> The Economist (Economist.com 2000b): "Although global warming may play a role, much of the blame for the plight of the world's coral reefs, with 30 percent lost already, and another 18 percent at risk in the next decade, rests with a myriad local decisions made by the 500m or so people who live close to those reefs".

> Mastny (2001) in World Watch: "An estimated 11 percent of the world's coral reefs have been lost as a result of direct human pressures. These include fishing and coral mining, coastal development, waste dumping, vessel collisions, and inland deforestation and farming, which can cause runoff of harmful nutrients and sediments. Such activities now threaten nearly 60 percent of all reefs".

> Denecke (2001) in the UNESCO Courier: "Threatened by pollution, overfishing and global warming coral reefs—a lifeline for millions of people—are dying off at an alarming rate... in the past few decades, more than one quarter of the world's coral reefs have been destroyed by human activity. At the present rate, at least 57 percent will be lost within our lifetime."

Underlying the Narrative

Having described how the crisis has been discursively created and recirculated as a narrative, this penultimate section discusses the call to action this forms. It traces the relationship between this imperative for action and the concepts of ecology underlying the narrative.

A CALL TO ACTION

Rather than the objective of extending the scope of human knowledge through scientific research, Wilkinson has had another objective, to stimulate international action, as shown in this quotation from an email he sent me after I had informed him that I was tracing how estimates had been quoted:

> I often sit in an audience and hear them [Wilkinson's own quantitative assessments of areas of reef damaged or lost] quoted back to me by Ministers and Presidents, who have no idea where the numbers have come from (which is fine with me) and [who] use them for justification for actions to conserve the reefs (which was the original purpose as we could not match the numbers that were being used by the forest lobby or mangrove lobby of direct areas lost). The numbers from1992/3 have probably been a partial to major catalyst for most of the coral reef initiatives since then including ICRI. So I am pleased to see the numbers used without attribution or even incorrectly quoted if the objective is to conserve reefs (Wilkinson, email to author, 11 June 2003).

Wilkinson was, in this way, using estimates of degraded reef area, with the intention of saving coral reefs by getting people to take notice and do something. In order to stimulate action for what he believes is a worthy cause, he presented a sparse amount of data in a way that made it appear as a more precise estimate of the reality of reefs 'out there' that it was. Other coral reef scientists have taken a

similar tack. For instance, in reviewing literature about ecological changes in coral reefs over recent years, McClanahan (2002), made a series of predictions about 'the near future' of reefs:

> We can generally expect to see a shift in benthic dominance from late-successional coral to algal taxa with higher organic but lower organic production and a consequent loss of reef growth and substratum complexity. Losses in coral species at the local level and possible extinction in regions with small shelf size are expected to continue. The consumer community will shift from large-bodies, edible, slow-growing and ornamental species to various unused invertebrates and some fast-growing and colonising generalist fishes. In many places reefs will be replaced or colonised by seagrass, rubble, and sand ecosystems (McClanahan 2002 p. 474).

McClanahan (2002 p. 468) described his predictions as "ecologically conservative" in that "they are made to increase awareness and future monitoring of potentially detrimental ecological changes and to provoke the application of the precautionary principle". He then used these predictions to justify an international approach to managing coral reefs and human impacts upon them (McClanahan 2002 p. 476). This is a similar motive to that admitted by Wilkinson above. This is science/policy at work, promoting pre-selected polices by framing these in ways believed to enhance environmental preservation (as Litfin 1994 p. 198 described in her research into ozone discourses). Thus Wilkinson, McClanahan and others have responded to Latin's (1992) argument at the 7th International Coral Reef Symposium—the symposium at which Wilkinson first presented his quantitative data on the areas of reef degraded worldwide—that coral reef scientists should accept more responsibility for the subjects they study, get involved in influencing policy even though this meant making political and ethical judgements as well as scientific ones.

WRI, the *Reefs at Risk* publishers, had an additional intention. Their web site publicised the report as a neoliberal project, arguing that it showed the need to remove fishing subsidies. It is, however, a little hard to make that connection since the topical debate was about governments needing to stop subsidising their overseas fishing fleets, nothing to do with coral reef harvesting.

CONCEPTS OF ECOLOGY

Those responsible for designing and publishing the GCRMN, Reef Check and *Reefs at Risk* assessments of reef status have kept their assessment processes separate from key scientific debates about the future of coral reefs. In doing so, they have limited the potential for those debates to destabilise the narrative. The crisis narrative does not engage with key debates about either the rates of natural recovery of coral reefs or about the relative importance of reefal and non-reefal coral communities. If it were to do so, this would bring into question whether a crisis exists or, if it exists, whether it is of any consequence. I examine each debate in turn, then describe how this illuminates the notions of ecology underlying the narrative.

Ignoring the debate about natural recovery processes and rates

Within marine ecological science, a body of work explores how coral reef environments are characterised by natural disturbance, in an endeavour to understand how natural variability confounds studies of the effects of human activities on reefs (the state of knowledge is summarised in the text box

following). Yet, the analysis used in the *Reefs at Risk,* Reef Check and (until 2004, as discussed in Chapter Eight) the GCRMN assessments fail to take into account the ability of reefs to adapt to changing circumstances, or the process of recovery after disturbance. Furthermore, those analyses make no serious attempt to address either the natural variation in coral cover or the way that reefs recover from both natural disturbance and from short-term disturbances, whether acute or not, or whether natural or anthropogenic. While Wilkinson does contemplate the extent to which reefs recovered after the 1997/98 bleaching events (see Table 9 and its adjacent discussion in Chapter Five), he does not engage with the scientific debate about recovery processes, a point to which I return after outlining the nature of the scientific debate.

The debate about the natural rates of recovery of reefs after disturbance gained some prominence in 1997, due to Connell's study, which I described above. Of the 65 samples that Connell (1997) found with sufficient data to make a judgement, coral cover had not declined in 29 percent; it had declined and recovered in 29 percent; and had declined but not recover in 42 percent. Connell concluded that based on the assembled evidence, coral assemblages did not appear to be suffering worldwide degradation—in 58 percent of the studies surveyed, coral assemblages were relatively stable over ecological time scales. Many assemblages showed no decline, while others recovered from acute, short-term disturbances, such as widespread predator outbreaks or local episodes of bleaching, severe storms, sedimentation or air exposure. There was however, little recovery from chronic, continuing disturbances that directly alter the physical or biological environment; also a higher proportion of western Atlantic sites were in decline than in the Indo-Pacific sites (Connell 1997 p. 14).

Scientific perceptions of the fundamental nature of coral reefs, such as those in the text box below, also shape debate about whether coral reefs are in decline worldwide and whether this matters. In the 1970s and 1980s, coral reef scientists commonly thought that any slight change in coral reef conditions (such as temperature, salinity, turbidity, dissolved oxygen) would cause ecological disaster because coral species had a narrow habitat range (stenoecious) existing at the boundary of endurance of physical stress (e.g. Endean 1976; Salvat 1980 p. 341; Sorokin 1993 p. 407). They believed that when a reef community was disturbed or destroyed, then it would likely never recover to its former state. Since then mainstream scientific thinking about coral reefs has changed. Over the last twenty or so years, many scientists have come to consider that self-replacement and recovery from natural disturbance is the norm on coral reefs. Natural disturbances are theorised to play an important role in maintaining the diversity of organisms living on a reef. In giving greater emphasis to disturbance, cyclicity and chance than those of earlier decades, current coral reef paradigms recognise that coral reef ecosystems are not always benign and that population explosions and crashes, notably involving reef-building corals, echinoderms (such as the crown-of-thorns starfish) and algae, commonly occur on contemporary reefs (Done *et al.* 1996 p. 396).

NATURAL VARIABILITY AND CORAL REEFS

Recent texts and papers acknowledge coral reefs exist in environments subject to frequent disturbances on time-scales from minutes to years; they also acknowledge how this causes considerable variation across and amongst coral reefs. Tidal influences and temperature change cause daily fluctuations on any part of the reef. Temperature and tidal patterns also vary seasonally: along with solar radiation, sedimentation regimes, mean sea level, wave energy, nutrient concentrations, salinity values, and current regimes. These are known to occasionally damage reefs in several ways: wave action, fresh water inundation and decreases in salinity, siltation, exposure during extreme low water events, and high and low temperature extremes (Pearson 1981; Smith and Buddemeier 1992; Glynn 1993; Sorokin 1993 p. 401; Hughes 1993 quoted in Glynn 1996). Overlying this are annual or interannual fluctuations in solar radiation, the irregular oscillation of the Pacific's coupled ocean-atmosphere system, the El Niño southern oscillation (ENSO) linked the Asian monsoon which itself displays significant seasonal variation and interannual variability (Brown 1997 p. 231-238). Reefs are subject to other natural disturbances including predatory outbreaks and epizootics. Some natural disturbances reach catastrophic levels, causing mass mortality—mostly passing tropical cyclones, accompanied by heavy rain causing decreased salinity and massive siltation of reefs (Sorokin 1993 p. 401). Earthquakes and volcanic activity have also caused mass coral mortality (Stoddard 1972, also Griggs and Maragos 1974 both quoted in Sorokin 1993 p. 404).

The kinds, scales, duration, and intensities of natural disturbances that damage coral reefs vary not only temporally; they can also vary regionally, locally and at micro-scales on an individual reef (Hughes 1993). For instance water temperatures vary across reefs, those of shallow inner reef flats and reef crests being particularly variable (Brown 1997 p. 244). In a review, Brown (1997 p. 272) concluded that corals are well adapted to the changing and often extreme reef environment, having an armoury of phenotypic responses at organism, cellular and molecular levels. Throughout geological time, corals have responded to fluctuations through a variety of phenotypic and genetic adaptations (Brown 1997 p. 276). The extensive intraspecific genetic variation of most coral taxa permits rapid local adaptation in any one generation to environmental conditions encountered at a particular site. Corals are also capable of rapid phenotypic responses to predictable changes on a day-to-day and seasonal basis (Brown 1997 p. 276).

Scientists have developed various theories to accommodate different scales of ecological change on coral reefs. In Grassle's 'temporal mosaic' theory, reef communities are viewed as temporal mosaics in space, and reefs as a patchwork of communities in different stages of recovery from various sources of disturbance (Grigg and Dollar 1990). Done (1999 p. 76) suggested that Borman and Likens' 'shifting steady state mosaic' view of forest ecosystems could be a useful way of viewing reefs. This theory suggests that any point in an ecosystem is constantly cycling through changes in biomassand species composition and function; over the entire ecosystem over a reasonable period of time, gross primary

production equals total ecosystem respiration and there is no net change in total standing crop of living and dead biomass; species composition and relative importance of species being fairly constant. These theories are variants on the notion of stasis embedded in cybernetic ecology, based on multiple rather than single states of equilibrium. They reflect a wider change in ecology towards nonequilibrium theory, a shift towards the concept of evolutionary ecology, summarised by Scoones (1999 p. 481-483)

Today, accepted knowledge amongst coral reef scientists is that coral reefs usually recover from damage suffered during these types of natural fluctuations and disturbance, although in severe cases this may take many years. When there is significant mortality on a reef, from a hurricane for instance, recovery may take many years (Sorokin 1993 p. 401-402). Although individual sites may not fully recover after disturbance, at the scale of the landscape there is little overall change (Bythell *et al.* 2000). Much still remains to be understood, however. Most reef ecologists have focused on the recovery of corals and fishes after disturbances and less is known about the recovery of other groups of reef organisms after natural events such as diseases, predator outbreaks, and toxic plankton blooms that damage other coral reef organisms (M^{c}Clanahan *et al.* 2002).

Debate about the process of recovery after disturbance, the ability of reefs to adapt to changing circumstances, and how reefs recover from disturbances that have anthropogenic causes remains topical. It is found in scientific publications on coral reefs such as those quoted above and in a recent review of potential contributions of climate change to stresses on coral reef ecosystems, which the Pew Centre on Global Climate Change prepared to help inform debate on climate change (Buddemeier *et al.* 2004 p. 28-29). Various papers presented at the four-yearly International Coral Reef Symposia have discussed the issue (such as Connell's (1997) paper described above), and there have been debates on the electronic Coral-List discussion list maintained by NOAA, a list with international membership. (see http://coral.aoml.noaa.gov/mailman/listinfo/coral-list/, last accessed 20 July 2005). Yet, none of this scientific debate has been included in the GCRMN global status reports. Although the 2004 assessment gives some attention to the inherent recovery capacity of coral reefs, Wilkinson does not, in his analysis of observations from various countries, engage with this debate. He instead assumes that coral reefs generally have strong potential to recover from "true natural threats", listed as "tropical cyclonic storms, fresh water inundation, geological events, like earthquakes and volcanoes, and low levels of plagues and diseases" (Wilkinson 2004 p. 19). Wilkinson cautions that any additional human impacts on reefs, or any increase in the level of natural disturbances, will threaten the recovery being noted, although he does not cite any scientific evidence for this statement. Wilkinson then brings us back to the dire fate facing coral reefs by adding "this, however, is one of the predicted scenarios of global climate change. It is predicted that tropical storms could increase in frequency and severity, and the major global ocean currents may change" (Wilkinson 2004 p. 19-20).

Wilkinson's failure to engage with the complexities of marine ecological research and recent theories on this subject is interesting. It suggests that the GCRMN does not need such theories to lend it authority or credibility.

Ignoring the debate about the value of bioconstruction

Another debate that Wilkinson's GCRMN global assessment summary reports have ignored centres on the issue of whether, as a result of changing climate, many coral reefs will eventually be replaced by coral communities that do not form reefs—and whether this matters. Current scientific thinking, as seen in scientific publications about geo-chemical processes occurring on reefs, is that carbonate production is likely to decline in the future either through the removal of reef builders through phenomena such as mass coral bleaching, or through depressed calcification rates (Kleypas *et al.* 2001 p. 435). BBC Radio's Discovery programme recently discussed this scenario (on 23rd February 2005), highlighting coming changes in ocean chemistry and suggesting those impending changes had been known about for years but largely overlooked. Instead of explicitly tackling this issue, both the GCRMN global status reports and the *Reefs at Risk* analysis assumed implicitly that reefs, geological structures built through biological processes, were valuable and should be preserved as reefal communities.

The issue is confused by the way we choose to define coral reefs. Over the past few centuries, the way that scientists commonly define coral reefs has changed from focusing solely on geological structure to highlighting the interdependency of biological and geological processes (Kleypas *et al.* 2001). Recent definitions combine biological and geological features, emphasising reef-building corals, coralline algae communities, and the accumulation of carbonate matter (see the text box in Chapter Four defining what is a coral reef). Some scientists have tried to distinguish between a 'coral reef' as a sedimentary structure produced by a living coral reef community—defining 'coral reef community' as one which has the potential for reef production—and a 'coral community' that does not have that potential (Kleypas *et al.* 2001 p. 427). Areas where reef-building communities occur and appear to function ecologically as reefs but have not produced a coral reef structure are usually called 'marginal' reef areas (Kleypas *et al.* (2001 p. 427). In many ways those coral communities function in a similar manner to 'true' coral reefs except that their carbonate budgets are closer to zero (Kleypas *et al.* 2001).

Yet, scientists tend to value reef building, preferring reef building communities to non-reef building ones or to those in which carbonate consumption exceeds its accumulation (such as algal pavements). For instance, in a report published in the journal *Coral Reefs* looking at ecological criteria for evaluating coral reefs, Done (1995), values bioconstruction—which is what creates the topographical complexity that provides many different habitats that maintain reef diversity. One reason given is that bioconstruction allows reefs to cope with sea-level change, especially on atolls (Kleypas *et al.* 2001 p. 430).

There is a common assumption in the coral reef scientific literature that because coral communities presently build reefs, then they need do so. This is largely based on observations of reefs over the past few centuries, a period when a set of environmental conditions that are geologically and environmentally unusual, has favoured reef building (Kleypas *et al.* 2001 p. 435). Kleypas *et al.* (2001 p. 430) argued that non-reef coral communities are more common than reef scientists generally think. They suggested that it debatable whether reef building is an obligatory function of reef communities, or merely facultative (ibid). Both corals and reef building algae are organisms that have little internal

control on calcification; the degree of their calcification tends to reflect surrounding environmental conditions. These organisms therefore form massive reef deposits when environmental conditions are particularly favourable, as they have been in recent years (Kleypas *et al.* 2001 p. 430). Present-day coral reefs, on which reef scientists base their definition of reefs, are not the norm in reef ecosystems over geological timescales. Present interglacial climate, which appears particularly favourable for reef carbonate deposition and preservation, is representative of only ten percent of the past few million years. The currently low carbon dioxide atmospheric concentration is atypical for much of Earth's history (ibid). For these reasons, Kleypas *et al.* (2001p. 430) suggested that scientists are biased by the tendency of reefs to be preserved in the geological record and by present environmental conditions.

This leaves wide open the issue of whether we should be concerned about a decline in reef building activity. Unlike the debate over coral reef adaptation and selection in response to coral bleaching, this debate has not gained much prominence amongst the reef science community. It is a debate over values: do we value reefs as three-dimensional carbonate structures or as collections of corals and other organisms? This evolutionary view of coral reefs differs from cybernetic ecology's idea of nature as a cybernetic system with limits (described in Chapter Two) upon which both ecosystems-based policy and the coral reef crisis narrative rest. Evolutionary ecology perceives the management of ecological systems as a game (as described in Kwa (1986)). But it is cybernetic ecology's representations of nature and its notion of managing reefs in order to keep them from exceeding thresholds—a relationship resembling that between an engineer and a machine—that have dominated the coral reef science/policy found in GCRMN global status reports and in the construction of the crisis narrative.

In scientific papers about coral reefs, which advocate the protection and management of coral reefs, there has been a gradual shift from a perspective based upon cybernetic to one based upon evolutionary ecology. This shift recently began to influence GCRMN global status reports. The 2004 report added reef resilience to the standard list of management strategies being advocated; this concept derives from evolutionary rather than cybernetics ecology as I show in Chapter Eight. Despite this shift, Wilkinson avoids engaging with the debate which Kleypas and others are trying to stimulate. While he and others constructing the narrative in the form of GCRMN global status reports and scientific papers use the authority of science to make their arguments and recommendations appear valid, authoritative, and worth acting upon, they do so selectively, for political reasons.

Conclusion

This chapter has belied the impression left by the conventionally-styled account of the state of coral reefs in the last chapter. It shows how the notion that coral reefs are facing an imminent global crisis is not based on careful empirical measurement of trends in the condition of reefs over time, adjusted for natural variation— reefs exhibit considerable spatial and temporal variability—as might be assumed from its publication in scientific journals. It is, instead, based on collections of observations and anecdotes plus some monitoring studies, analysed without any adjustment for the noise provided by long-term 'natural' variability. Constructed from these assessments, the narrative has been reproduced through conference papers, declarations made at conferences, scientific publications, and popular

articles. It has been disseminated widely due to the efforts of policy staff employed by international organisations, and of scientists, some in research organisations, some employed by NGOs. Those disseminating the narrative, and enrolling the media, are part of what can be termed an international community of coral reef scientists who share an interest in coral reef science and in protecting coral reefs.

The puzzle is how, when the empirical evidence for the crisis is less than robust, the narrative has been both endlessly repeated and remained largely unchallenged. This may be due to the imperative that the concept of apocalypse, embedded in the cybernetic representation of nature upon which the narrative is based, has given it. As discussed in Chapter Two, that representation offers two possible future scenarios, either sustaining the nature in which we live, or its destruction. Moreover, the fear of apocalypse provides the impetus to pursue international cooperation in the mission of saving coral reef ecosystems from collapse.

Although I have shown how the crisis has been discursively constructed and disseminated, this is not sufficient to make it unworthy of belief, as some might suggest. Before making any such judgement, one should also assess the policy prescriptions based upon that narrative, their inherent power relations and political implications. The next chapter begins that, describing and analysing the ICRI network and its policy portfolio.

Chapter Seven

The International Coral Reef Initiative

Introduction

Whatever is happening in international policy endeavours concerned with coral reefs, it does not conform to the orthodox model of policy processes described in Chapter Two, in at least two important regards. First, the previous chapter showed science/policy in action—not as the provider of objective knowledge portrayed by the epistemological notion of scientific realism but as the creator of policy concern, collecting, generalising and reshaping scraps of information from various locations to produce the notion of coral reefs in crisis as a call to environmental action. Second, as I show in this chapter, the policy responses which ICRI, various UN agencies and NGOs have taken to the crisis have largely avoided the route of 'green diplomacy' entailed in formal multilateral negotiations and intergovernmental regime formation. Instead, their political assembly has taken the form of a network, enrolling people and places around the globe, the network multiplying its sphere of policy influence in ways that lie outside formal interstate diplomacy.

ICRI has expanded its sphere of influence by constructing new sets of connections, acquiring new capacities and expanding its agenda; the resultant network coming to represent new definitions of interests assembled around the notion of saving coral reefs. Building on the last two chapters, this chapter describes how this epistemic community has come into being and investigates its policies. In doing so, it sets the scene for understanding not only the hegemonic interests involved in forming ICRI, but also for seeing ICRI as a hegemonic network, a political assembly around the idea of worldwide coral reef degradation.

METHODOLOGY: RESEARCHING ICRI

There are few published accounts of international policy initiatives concerned with coral reefs, only some about ICRI's creation. In researching the history of these initiatives, I therefore relied on Internet sources, particularly the web sites of the organisations concerned. By searching for funding proposals, meeting agendas, and reports, I gradually pieced their stories together. Although I used primary sources as much as possible, I was occasionally not able to obtain some reports without turning this into a major exercise in compiling a historical record. In those cases, I relied on secondary documents (e.g. Sapp's history of the crown-of-thorns debate, 1999).

While drafting the history of international policy responses to worldwide coral reef degradation, the realisation of which organisations were key influencers came gradually. First, I noticed that besides founding ICRI, US state agencies had funded many other intergovernmental initiatives. To investigate whether this is a deliberate US strategy, I looked for written evidence of the US government's intention to influence international policy, locating this in documents relating to the US Coral Reef Task Force. Considering the history of NGOs working on international coral reef conservation and policy, I realised that the WWF organisation was also playing a key, but not always immediately obvious, role in coalitions and partnerships conceptualising and developing new ways to address the environmental crisis. WWF was bringing new policy ideas to bear on the problems facing coral reefs—from neoliberal approaches involving the private sector in conservation to new ways of implementing conservation on a large scale. This prompted me to investigate WWF's involvement in international coral reef policy and the WWF sites from which those ideas were emanating. The idea that ICRI represented an alliance of different interests developed out of those investigations.

The ICRI Network

THE SHAPE OF THE NETWORK

The emergence of ICRI

ICRI emerged from the US, as part of the country's response to UNCED and the integrated coastal zone management provisions in Chapter 17A of Agenda 21. In 1994 the Department of State, when formulating the US domestic response, added an international component, an idea promoted at a meeting of federal agency representatives, scientists, coastal managers, and NGOs (Mieremet 1996 p. 306). This proposed international venture should, according to its newly appointed steering committee, support and build capacity for coral reef research and monitoring, policy setting and management (Mieremet 1996 p. 307, 327). The US sought other government partners for this international coral reef initiative, already named ICRI. At a US/Japan Common Agenda meeting on the environment, US President Clinton and Japanese Prime Minister Murayama agreed to cooperate on this. The US Government (through the Department of State) then invited other governments to join the ICRI

partnership, sending out bulletins, announcing it at the UN's Global Conference on the Sustainable Development of Small Island Developing States (GCSDSIDS) at Barbados in May 1994 and at the first CoP of the CBD held that December. At GCSDSIDS, Pacific and Indian Ocean island nations expressed their concern with the deteriorating condition of coral reefs, adding to the international calls to address these problems (SPREP 1993; Moses 1994; Morozova 2000). By the end of 1994, six other governments had joined ICRI as partners, and other international organisations had lent their support (Table 11), making financial commitments to set up an ICRI Executive Planning Committee and a supporting Secretariat (Drake 1996; Morozova 2000). Intergovernmental agencies adding their support included four UN bodies—UNESCO-IOC, UNEP, UNEP-WCMC and UNDP. The WorldFish Centre and the IUCN added theirs, and both the World Bank and Global Environment Facility made contributions.

TABLE 11: INTERNATIONAL CORAL REEF INITIATIVE: PARTNERS AND SUPPORTING ORGANISATIONS

Government Partners	Australia, Britain, France, Jamaica, Japan, Philippines, Sweden, USA
Supporting Organisations	UNESCO, UNEP and UNEP's Caribbean programme, World Bank, UNDP, IUCN, SPREP, Inter-America Development Bank, Co-ordinating Body on Southeast Asia

Source: Mieremet (1996 p. 309-310)

The *Call to Action*

ICRI's policy is officially set out in a *Call to Action* and an accompanying *Framework for Action*, formulated at an international workshop held at Dumaguete in the Philippines at the end of May 1995, and attended by 120 people from 44 countries—a mix of policy makers, managers, scientists and private sector interests (Mieremet 1996 p. 312, 319). The *Call to Action* is based upon the premise that coral reefs are "in serious decline globally, especially those near shallow shelves and dense populations" (Chapter Five). It describes planning and management of both coastal land use and upland activities as inadequate, and states that threats from human-related impacts can be minimised or eliminated through improved and sustained management practices. This, it argues, requires an increase in political support and in national and local coral reef management capacities. To address those threats, the *Call to Action* seeks a co-ordinated international approach, calling for important and new information related to maintaining the health of these ecosystems to be shared. In this call for rational planning and international cooperation, the statement echoes the orthodox version of the discourse of global environmental policy.

The *Call to Action* is eclectic in its approach to saving coral reefs (Table 12). It endorses integrated coastal management, ecosystems-based management, and programmes for community-based management or co-management of reef resources. It seeks to build capacity through education and

information programmes, information exchanges with 'stakeholder communities', regional networks sharing knowledge and skills, and through improved access for developing nations to bilateral, multilateral and other forms of financial and technical support for reef management. In supporting research and monitoring, it endorses the need for a global coral reef monitoring network as discussed in the previous chapter, regional networks linking national research programs, and better links between regional and global research and monitoring networks. Its eclecticism brings to mind March and Olsen's garbage can model of policy—ideas thrown in and stirred together. This mix reflects the diverse agendas of organisations which have combined to use ICRI as a platform to get their ideas onto the international policy stage, examined later in the chapter.

The purpose of the longer *Framework for Action* is described as being to mobilise governments and the wide range of other stakeholders whose co-ordinated, vigorous and effective actions are required to implement the *Call to Action*. It, too, promotes an eclectic collection of tools: an intersectoral systems approach to planning and management; a global system of coastal and marine protected areas; the regulation of international trade; environmental assessment of development activities; voluntary programmes, economic incentives, and management guides for controlling pollution (International Coral Reef Initiative 1995b).

One (orthodox) way of interpreting ICRI's *Call to Action* is as the collective wisdom of an epistemic community *sensu* Haas (Chapter Two). This is the interpretation which ICRI promoted in its report of the Dumaguete workshop, which refers to the "collective deliberation and wisdom of participants". The report describes participants as "an extraordinary mix of participants—ambassadors, scientists, resource managers, and enforcement personnel, donor, nongovernmental, and private sector representatives—all of whom share the same commitment to the conservation, restoration and sustainable use of coral reefs and related ecosystems" (International Coral Reef Initiative 1995c). Both the *Call to Action* and its accompanying *Framework for Action* are usually referred to in a way that implies they were the result of a large group of experts meeting, discussing and agreeing how best to tackle a serious and difficult problem—ie a highly analytical, participatory, and democratic process, drawing on the "collective deliberation and wisdom of participants" (International Coral Reef Initiative 1995c). The *Call to Action* was, however, largely drafted by a small group of people who convened the workshop. ICRI's coordinator and secretariat staff, with the help of ICRI's Executive Planning Committee (CPC), prepared the draft and presented it to the workshop to consider and endorse (Mieremet 1996 p. 312, 319). They selected a 'representative team of participants' to develop a longer *Framework to Action*, intended to provide more in-depth guidance to planned regional workshops (Mieremet 1996 p. 311-312). Workshop participants endorsed this second statement as well.

TABLE 12: THE MEASURES THAT ICRI'S *CALL TO ACTION* SEEKS

The ICRI governments endorse the following measures, to be implemented through global, regional, and national actions:

Coastal Management

- Incorporate integrated coastal management measures into local, national, and regional coastal development plans and projects, and support their long-term implementation. These measures will serve as the framework for achieving the sustainable use of, and maintaining the health of, coral reefs and associated environments
- Develop coral reef initiatives (regional, national and/or local). These should use an ecosystem-based, integrated approach that encourages participation and includes programs for community-based management or co-management of reef resources

Capacity Building

- Establish regional networks to share knowledge, skills, and information
- Develop and support educational and informational programs aimed at reducing adverse impacts of human activities
- Establish information exchanges with stakeholder communities
- Improve developing nations access to bilateral, multilateral, and other forms of financial and technical support for coral reef management

Research and Monitoring

- Use regional networks to achieve better coordination and cooperation among national research programmes
- Promote linkages between regional and global research and monitoring networks, such as CARICOMP (Caribbean Coastal Marine Productivity), PACICOMP (Pacific Coastal Marine Productivity), and GOOS (Global Ocean Observing System)
- Support research and monitoring programs, projects, or activities identified as essential to managing coral reef ecosystems for the benefit of humankind
- Promote the development and maintenance of a global coral reef monitoring network

Review

- Periodically review the extent and success of implementation of actions identified in the initiative

The Nations and organizations supporting ICRI call upon all other relevant international entities, governmental and nongovernmental organizations, including the private sector and scientific communities, to undertake the actions above.

Source: International Coral Reef Initiative (1995a)

How ICRI operates

Initially the US State Department supplied a coordinator for ICRI and the secretariat was formed by *ad hoc* assignments from US various agencies, on the understanding that other partners would fund and organise these roles later—as eventuated and as shown in Table 13 (Mieremet 1996 p. 311).

TABLE 13: HOSTS FOR THE SECRETARIAT OF THE INTERNATIONAL CORAL REEF INITIATIVE

Period	Host organisation/ government
1994/96	USA, Department of State
1996/98	Australia, Great Barrier Reef Marine Park Authority
1999/00	France, Ministry for Environment
2001/02	Philippines, Department of Environment and Natural Resources; in partnership with Sweden
2003/05	Seychelles, Centre for Marine Research and Technology–Marine Parks Authority; in partnership with Britain
2005/07	Palau in partnership with Japan

Source: web sites www.icriforum.org and NOAA's Coral Health and Monitoring Programme www.coral.noaa.gov/ ; Mieremet (1996); Souter and Lindén (c.1999)

From this a network of linked organisations concerned with international coral reef policy has grown. GCRMN, established around the same time as ICRI with funds from various states, principally the US plus the GEF (Table 14), immediately became part of the ICRI network. GCRMN maintains close links with several intergovernmental organisations through its management committee structure (see text box *Introducing the Players 4: GCRMN* in Chapter Five). Initially a UNESCO-IOC initiative, GCRMN is now largely under the wing of the IUCN-the World Conservation Union, part of the latter's global coral reef portfolio (Sherwood 2004). The US Department of State, NOAA, and AIMS remain GCRMN's principal funders and AIMS provides the coordinator (Wilkinson 2004 p. xii).

TABLE 14: ORGANISATIONS FUNDING GCRMN'S ESTABLISHMENT

Funding for initial set up and operation	Funding and support for global coordinator
US Department of State; National Oceanic and Atmospheric Administration	US contribution to the IOC Trust Fund
UK Department of International Development	Co-hosted jointly by AIMS and ICLARM (now known as the World Fish Centre)
Swedish International Development Agency (SIDA); Swedish Agency for Research Cooperation with development countries (Sarec)	
Government of France	
Government of Japan	
Global Environment Facility	

Source: Global Coral Reef Monitoring Network (1997; 2003)

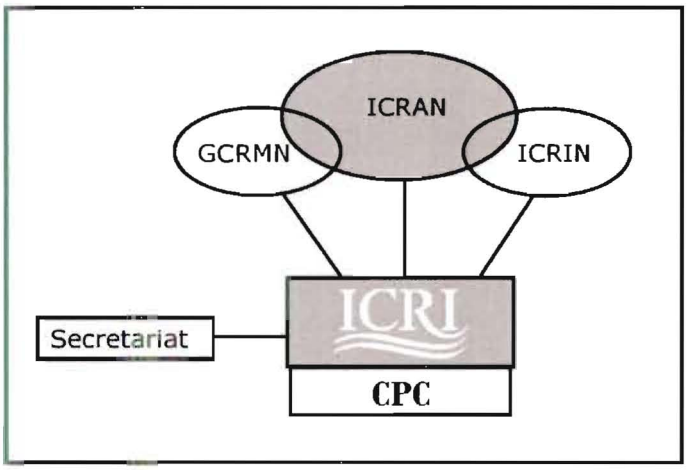
GCRMN is the arm of the ICRI network committed to collecting and disseminating data and information about the health and ecology of coral reefs worldwide. It provides the justification for ICRI's coral reef policy by reporting on the extent of reef degradation and (lack of) protection. GCRMN and ICRI operate separately, under their different governance structures. The opportunity to discuss their respective efforts as part of an integrated approach to the *Call to Action* occurs six-monthly at meetings of ICRI. At those meetings, often held in conjunction with international coral reef events, representatives of the various arms of the ICRI network report on past work and discuss future actions. ICRI operates through a combination of these six monthly meetings and a web site containing a bulletin board onto which registered users can log. The latter is used to post meeting agenda and minutes, discussion papers and draft proposals.

ICRI recently sought to formalise its policy basis. Over several years it had operated without any formal governance structure, many without formal lines of accountability to state policy agencies. Then in 2003, at the behest of several CPC members, ICRI adopted formal rules. Any UN member state is eligible to become an ICRI member, as is any specialised agency or programme of the UN system or any international, intergovernmental or non-governmental organisation with significant national, regional, or global coral reef programmes or interests. Now, at ICRI meetings only members are allowed to vote. The original membership consists of states and organisations that issued or endorsed the ICRI *Call to Action* or the *Renewed Call to Action* and *Framework for Action*. New members must attend a General Meeting and make a statement of their support for the latter two documents (International Coral Reef Initiative 2003).

Components of the ICRI network

Between 1999 and 2002, ICRI-CPC members and other interested players established further operational ICRI networks (depicted in Figure 4) to co-ordinate work on the *Call to Action* objectives.

FIGURE 4: THE ICRI NETWORK



GCRMN: Global Coral Reef Monitoring Network
ICRI: International Coral Reef Initiative
ICRAN: International Coral Reef Action Network
ICRIN: International Coral Reef Information Network

Source: International Coral Reef Action Network (2001)

International Coral Reef Information Network (ICRIN)

In 1999, the ICRI-CPC created the International Coral Reef Information Network (ICRIN), to advance public awareness goals in ICRI's *Framework of Action*. CPC members envisaged ICRIN would lead a major international public relations campaign, communicate the need to protect coral reefs to senior decision-makers and opinion leaders and to the tourism and fishing industries (International Coral Reef Information Network 2001). The CPC asked the Coral Reef Alliance (CORAL) a US-based NGO (online at www.coralreef.org) that led the public awareness efforts of the International Year of the Reef 1997, to co-ordinate ICRIN activities, in consultation with the ICRI Secretariat. Initially seeking over USD 3 million from the United Nations Foundation (UNF), CORAL was able to raise only USD 666,000 and the initiative was therefore refocused (International Coral Reef Initiative 2001). Between 2001-2004 ICRIN operated as a UNEP project (Coral Reef Alliance/ International Coral Reef Information Network 2003; CORAL/ICRIN report in International Coral Reef Initiative 2004). Much of the material CORAL produced supported the third component of the ICRI network, the International Coral Reef Action Network (ICRAN).

International Coral Reef Action Network (ICRAN)

Like ICRIN, ICRAN was set up to implement the *Call to Action*, integrating international efforts to protect coral reefs that previously operating independently (International Coral Reef Action Network 2001). Conceived by ICLARM and UNEP in the late 1990s, originally as a joint project with FAO, ICRAN was to serve as an umbrella for demonstration sites around the world showcasing successful marine protected areas conservation projects, and serving as training facilities (International Coral Reef Action Network 2001). It then evolved into a fundraising venture to support existing parts of the ICRI network (the ICRI secretariat, GCRMN and ICRIN) and to raise funds for new projects proposed by ICLARM, WRI, UNEP-WCMC, SPREP and Reef Check—between 20-40 million USD being sought. The funding proposal was thus designed to expand the work of international organisations already involved in coral reef matters. The United Nations Fund for International Partnerships (UNFIP) co-ordinated an application to UNF, which subsequently pledged USD 10 million to cover core costs from 2001 to 2004, during which time ICRAN hoped to raise USD 20 million for an International Coral Reef Fund, to expand the network and finance further activities (International Coral Reef Action Network 2002).

Core costs having been met, an ICRAN Board and a steering committee were formed, with UNEP providing coordination and administration (ICRAN Board report in International Coral Reef Initiative 1995a). ICRAN then hired a fundraiser who targeted a long list of foundations and philanthropic organisations and private businesses (largely American). The September 2001 terrorist attacks on the USA dramatically changed the funding situation however, and by the end of 2003 ICRAN had only managed to raise USD 332,000 for demonstration projects, intended to highlight successful examples of coral reef management and to promote good management practices at others (Telekei 2003). Although by 2002, ICRAN had 32 demonstration sites in the Caribbean, East Africa, East Asia and the South Pacific (six in the latter), many were pre-existing projects brought into the ICRAN fold (International Coral Reef Action Network 2002).

ICRAN partners are listed in Table 15, below. Within the United Nations system, ICRAN's main links are with UNEP, which administers the UNF funding. ICRAN operates through UNEP's Regional Seas Programmes and is linked to ICRI through its Board which includes two ICRI Secretariat members.

TABLE 15: ORGANISATIONS THAT ARE PARTNERS IN ICRAN

Partner Organisations
Coral Reef Alliance (CORAL)
Global Coral Reef Monitoring Network (GCRMN)
International Coral Reef Initiative-Coordinating Planning Committee (ICRI-CPC)
Marine Aquarium Council (MAC)
Reef Check
South Asia Cooperative Environment Programme (SACEP)
South Pacific Regional Environment Program (SPREP)
The Nature Conservancy (TNC)
United Nations Environment Programme – Coral Reef Unit
United Nations Environment Programme – Division of Technology, Industry and Economics
United Nations Environment Programme – World Conservation Monitoring Centre (UNEP-WCMC)
United Nations Foundation (UNF)
WorldFish Centre (formerly ICLARM)
World Resources Institute (WRI)
World Wildlife Fund (WWF)

Source: ICRAN web site at www.icran.org, consulted 18 July 2004.

The ICRI network's policy influence: disseminating the message

ICRI is at the core of a complex web of international relationships, conduits for the passage of funds, information and expertise intended to generate international responses to rising concern about worldwide degradation of coral reefs. An alliance of intergovernmental organisations (mostly but not exclusively UN ones), a handful of states including the US, and prominent members of the international coral reef science community, ICRI represents an attempt to create a top-down policy agenda ultimately intended to influence the conduct of a multitude of people in different locales.

ICRI has expanded at international level because of the efforts of a small group of determined people who played a key role in mobilising international interest in coral reef policy. The network grew not so much because of growing government interest within the countries forming ICRI but because of the networking efforts of those involved in ICRI itself. Using ICRI and GCRMN as a base, these networkers made considerable, largely successful, efforts to persuade existing IGOs, including the multilateral conventions, to put coral reefs on their agenda, thus drawing those organisations into the campaign to save coral reefs. They drew up lists of upcoming international meetings, including those of multilateral environmental agreements (MEAs), (posted on the ICRI web site) and assigned particular

people to attend and present the ICRI case. The CPC also publicised ICRI's message at various international environmental forums including UNEP's Global Plan of Action to Protect the Marine Environment from Land-Based Activities, the Second Conference of the Parties (CoP) to CBD, the CoP of the Ramsar Convention, and the Commission on Sustainable Development (CSD).

One result of this, which continues today, is that existing MEAs have begun to emphasise coral reefs as worthy of protection. When anxiety about coral reefs began to gel internationally in the early 1990s, there were no MEAs focusing specifically on reefs. Some agreements, such as CITES (Chapter Five) did, however, provide a measure of protection; the Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention), which entered into force in 1983, protects some sea turtles (UNEP Coral Reef Unit and WWF Coral Reefs Advisory Initiative 2003 p. 14). Since 1975, specific coral reef areas have been able to be protected under two international conventions: the Ramsar Convention on Wetlands (which promotes international cooperation in the conservation and wise use of wetlands and shallow inshore areas) and the World Heritage Convention (which lists sites whose outstanding cultural and natural heritage values should be reserved for all humanity, including the Great Barrier Reef listed in 1981) (Kurukulasuriya *et al.* 1998; UNEP Coral Reef Unit and WWF Coral Reefs Advisory Initiative 2003). The Great Barrier Reef aside, neither convention paid much attention to coral reef decline until the late 1990s, when ICRI members made a concerted effort to draw their attention to this. Both now place much greater emphasis on coral reefs, both in seeking to add sites to their protected list and in managing sites already listed (UNESCO World Heritage Centre Report in International Coral Reef Initiative 2004).

Between June 1995 and September 1997, ICRI held seven regional workshops, including one in the Fiji Islands in late 1995. These helped mobilise various regional groups interested in coral reef matters, and several regional initiatives resulted. The largest regional initiative associated with ICRI is CORDIO, a programme created in 1999 with the support of the Swedish government and the World Bank, to assess the widespread degradation of the coral reefs throughout the central and western Indian Ocean (Sherwood 2004 p. 13). Increasingly, CORDIO's research has focused on mitigating damage to reefs and on alternative livelihoods for people dependant on reefs. Supported by the Swedish International Development Cooperation Agency (Sida), the Government of Finland, the Dutch Trust Fund of the World Bank, WWF and IUCN, these efforts involve researchers in 11 countries. There are also regional initiatives in the Caribbean (the Atlantic and Gulf Rapid Reef Assessment (AGRRA) Programme and the Caribbean Coastal Marine Productivity Programme (CARICOMP)), focusing on research and monitoring rather than policy matters.

Despite preparation of a regional ICRI strategy (SPREP 1996), initial attempts to establish regional coordination in the Pacific through SPREP failed due to a lack of funds. Instead the US government built its own Pacific regional initiative; 90 percent of US coral reefs surround US islands in the Pacific and the remainder are located off Florida, Georgia, Texas and the US islands in the Caribbean (US Department of the Interior 1999). The US government initially focused on Hawai'i, the Commonwealth of the Northern Marianas and the various US territories in the Pacific (see Table 3) as part of its US All Islands Coral Reef Initiative Strategy; then, in 2000, it invited Pacific states freely associated with the

US to participate the USCRTF as non-voting members (United States Coral Reef Task Force 2000b, see also www.coralreef.gov/taskforce/agencies.html, last accessed 30 July 2005).

INTRODUCING THE PLAYERS. 11: PACIFIC REGIONAL ENVIRONMENT PROGRAMME (SPREP)

SPREP is a regional Pacific-wide intergovernmental organisation, founded in the late 1970s. Originally called the South Pacific Environment Programme, it dropped the 'South' in late 2004 but retained the acronym. Created initially as a programme of the South Pacific Commission in Nouméa (New Caledonia) in the late 1970s, SPREP became autonomous in 1995, having moved to Apia, Samoa. SPREP's members are the twenty-two Pacific island countries along with Australia, New Zealand, France and the USA. Its principal role is to promote cooperation and assist its members with issues of environmental management and conservation. Member countries express their needs for assistance through national planning mechanisms which are conveyed to regional planning forums including the annual SPREP meeting.

SPREP is UNEP's Regional Seas Programme in the Pacific, a role it has undertaken since first created. UNEP was one of two UN agencies instrumental in having the SPREP programme created (the other being the United Nations Economic and Social Commission for Asia and the Pacific). It was Arthur Dahl, recently retired manager of UNEP Coral Reef Unit, who was largely responsible for setting up SPREP when he worked at SPC in Noumea in the 1970s.

Donor funding for projects forms the bulk (90 percent) of SPREP's budget. The remainder is core funding from member countries' annual subscriptions and from project management fees, plus some discretionary funding from the Australian and New Zealand governments. The US provides much of SPREP's funding.

Sources: SPC (1980); AusAID (2000); Turnbull (2001)

In the late 1990s, the French government included other islands in the Pacific—the French overseas territories of New Caledonia, French Polynesia, Wallis and Futuna, which collectively comprise 97 percent of France's coral reefs—in its own national initiative for coral reefs, L'Initiative Française sur les Récifs Coralliens (IFRECOR). Launched to coincide with the French government's hosting of the ICRI secretariat, IFRECOR effectively brought these territories into the ICRI and GCRMN network through the local committees established in each territory (Voynet *et al.* 2000; Ministère de l'Outre-Mer and Ministère de l'Ecologie at du Développement Durable c.2003).

This left other Pacific states and territories (such as the Fiji Islands, Kiribati, Solomon Islands, Vanuatu, and Samoa) outside any of the regional initiatives formed under the ICRI umbrella, a situation not reversed until late 2004, when Agence Française de Développement (the French Development Agency, AFD) launched the French Regional Initiative for the Protection and Management of Coral Reefs in the Pacific (CRISP). This three-year programme of interventions

planned for 15 island countries and territories of the South Pacific entails four main contractors (CI, UNF, and two French agencies, Centre National de la Recherche Scientifique (CNRS) and Institute de Recherche pour le Développement (IRD)) plus 17 operators. The budget, as at 1 January 2005, is 8.7 M€, comprising 6.1 M€ from French agencies (AFD, the French GEF, IRD and Ministre des Affaires Étrangères (French Ministry of Foreign Affairs, MAE)), plus 2.6 M€ from a combination of CI, WWF, and UNF (International Coral Reef Initiative 2005b). As part of the programme, the French Government and ICRAN have funded ReefBase to step up its activities in the Pacific (International Coral Reef Initiative 2005a). The CRISP programme also aims to develop an ecoregional strategy of reef biodiversity conservation, set up marine protected areas and support existing ones, and develop tools for integrated coastal management. Other parts of the programme focus on monitoring, rehabilitation and identifying pharmacologically-active substances in reef ecosystems (CRISP Coral Reef Initiative for the South Pacific 2005).

To recap, ICRI, as a result of its expansion and networking with other organisations, and the regional workshops and subsequent regional initiatives, has extensive arrangements for implementing its policy agenda aimed at altering the conduct of people living near and using reefs. These include ICRAN demonstration projects, various regional programmes such as CRISP, NGO projects, GCRMN training, and representatives from MEAs and IGOs encouraging governments to control peoples' conduct through legislation, policy, and enforcement.

THE ICRI POLICY AGENDA

Even so, ICRI policy remains outside the ambit of international law. The *Call to Action* was not a statement negotiated by official representatives accorded the authority of their government to do so. It does not have the status of an 'official' MEA, although both the Governing Council of UNEP and the IOC subsequently passed resolutions supporting it (International Coral Reef Initiative 1995c). Rather, it is an evolving statement of topical policy ideas drawn from eclectic sources and legitimised by being 'approved' at international conferences.

Since the *Call to Action* was formulated, ICRI's policy has evolved in an *ad hoc* fashion through further conference statements and declarations calling for immediate action to save coral reefs. These were made at the inaugural ITMEMS in 1998, at ITMEMS II in 2003 and at the 10th International Coral Reef Symposium in 2004 (which produced the Okinawa Declaration, a statement discussed in Chapter Eight). In addition, GCRMN global status reports act as a *de facto* source of international policy, summarising recommendations made in various national and regional reports prepared for inclusion. These policy statements (ICRI's, ITMEMS and the GCRMN) recognise the need for widespread international cooperation to halt degradation to coral reefs and prevent their further demise. They all echo orthodox environmental policy discourse (Chapter Two). All are an eclectic mix of goals, strategies and tools, both relatively old ideas such as marine protected areas and newer ones including neoliberal approaches such as Marine Aquarium Council's scheme, described in the text box below.

INTRODUCING THE PLAYERS: 12. MARINE AQUARIUM COUNCIL (MAC)

MAC is a US-based NGO created specifically to address the international trade in reef organisms destined for home aquaria. MAC is promoting a commercial certification scheme, a type of voluntary eco-labelling targeting all stages of the industry from collection to sale in retail outlets. This is based around global standards for collecting, handling and exporting marine organisms, and on setting up quality management systems at each step from collection to ultimate sale to aquarium owners. As well as benefiting those in the industry who choose to participate (importers and retailers as well as collectors and exporters) by enabling them to label their products as 'green' and capture a bigger share of the market and a higher price for their certified fish and corals, the scheme is intended to ensure reefs are not over-harvested, hopefully driving out of business those collectors and exporters who 'mine' areas then move on.

WWF and the [US] Pet Industry Joint Advisory Council (PIJAC) spearheaded the efforts to establish MAC; other NGO and trade organisations included their discussions were the American Marinelife Dealers Association, American Zoo and Aquarium Association, Ornamental Fish Industry Limited (UK), the Haribon Foundation (Philippines), International Marinelife Alliance (Philippines), Ocean Voice International (Canada), Conservation International, Flora and Fauna International (UK), and The Nature Conservancy. Several organisations funded WWF's efforts to establish MAC, including USAID, The David and Lucile Packard Foundation and the John D. and Catherine T. MacArthur Foundation. Paul Holthus of IUCN's Marine and Coastal Programme was recruited to run MAC and develop the certification scheme, which Chapter Twelve describes. Several of the North Americans involved in founding IMA and some from Ocean Voice International's Philippine work (described in Chapter Five) were subsequently involved in developing MAC and its scheme.

Source: SPREP (1993; 2002b); Hauter (1998); Bunting (2001); Bunting and Meyers (2002); Peter Rubec and Steve Robinson, *pers. comms*.

In these statements made after the original *Call to Action* and *Framework for Action*, there have been some changes in the policy approach sought, listed below:

- the need to find alternative livelihoods (ITMEMS II)
- sustainable financing (ITMEMS II)
- protecting fish spawning aggregations (ITMEMS II)
- sustainable mariculture to reduce the take of wildfish (ITMEMS II)
- the need to reduce greenhouse gas production (Okinawa Declaration)
- a focus on finding ways of helping reefs become resilient to chronic large-scale effects such as climate change, incorporating suitable tools (such as MPA selection, design and management) into coastal management strategies (mentioned in the GCRMN 2004 global status report and discussed in the next chapter).

Although there has been no significant shift in policy direction since the *Call to Action* was drafted in 1994, there has, however, been a broadening in the approach to development intertwined with the ICRI agenda, reflected in the support for alternative livelihoods and sustainable financing (listed above). This echoes changes in the direction of the international policy agenda for development aid. Additionally, the debate about climate change, lurking in the background of earlier statements, made an explicit appearance in the Okinawa Declaration, reflecting the unhappiness of many American coral reef scientists with the Bush government's policies on that subject (*pers. obs.*).

ICRI's policy as an expression of modernisation

ICRI's policy agenda represents the technocratic pursuit of knowledge and the search for control over nature which typify the discourse of global environmental policy described in Chapter Two. ICRI's strategy, along with the work of the various organisations involved in the network, expresses a strong faith in the ability and appropriateness of science to identify and solve the problems facing coral reefs. ICRI's strategy positions experts through 'expert policy discourses', best understood as technologies such as marine protected areas, reef resilience, ecoregion planning and eco-labelling. The strategy of utilising expert policy technologies expresses faith that the application of reason, exemplified by science, enables humans to discover *the* truth about the nature of reality and thus to understand how people are causing coral reef degradation and how this might be addressed and coral reefs saved.

ICRI's environmentalism is not anti-modern against capitalism, industrialism, modern science and technology because of their effects of the environment. Rather, it is a very modern environmentalism. ICRI views the institutions of modernity not only as the main causes of environmental problems but also as the saviours of modernising countries—just as ecological modernisation sees them as the principal instruments of ecological reform in industrialised countries. ICRI's policy agenda reflects modernisation theory's confidence in the ability of international efforts to address, through scientific reason, instrumental rationality, international cooperation and progress, the challenges posed by widespread environmental degradation.

Sources of Influence upon the ICRI Network

The ICRI network can be seen both as a way for participating organisations to place their own policy ideas onto an international agenda, and as a way for its members, acting collectively, to disseminate ideas and to influence policy in far-flung parts of the globe. It is thus both a collecting and a dispersal mechanism for policy ideas. There are clearly some key organisations using the ICRI network to place their ideas on the international policy agenda. These include, but are not limited to, the US state, the World Bank and GEF. I examine each below, as well as the influence of the reef science community and NGOs.

THE WORLD BANK AND GLOBAL ENVIRONMENT FACILITY

The World Bank and GEF are represented in the governance structures of ICRI through both ICRAN's Board and the GCRMN management committee. In addition, there has usually been a World Bank representative at ICRI–CPC meetings, as the minutes on their web site show.

Both the World Bank and the GEF support ICRI (Tables 11 and 14) and both are key financiers and managers of coral reef projects around the world, including the CRISP project in the Pacific described earlier. The Bank's portfolio of coral reef projects between 1991 and 2001 has been estimated at over USD 125 million, the GEF financing over half this. The Bank has programmes focusing on coral reef biodiversity conservation, primarily aimed at establishing marine protected areas. These include several large regional projects such as the Coral Reef Rehabilitation and Management Project in Indonesia (COREMAP), the Strategic Action Programme for the Red Sea and Gulf of Aden, and the MesoAmerican Barrier Reef System in the Caribbean (International Coral Reef Action Network 2001). UNEP-GEF separately finances coral reef conservation projects—18 projects by 2004, so many that it has launched a SHARK (SHAring Reef Knowledge) learning network to facilitate information exchange amongst participants (United Nations Development Programme - Global Environment Facility 2004).

Latterly, the Bank and the GEF are taking a scientific approach to reef conservation. In November 2004, they announced a jointly-funded initiative to help protect coral reefs in developing countries: a USD 23 million Coral Reef Targeted Research and Capacity Building Project (Global Environment Facility 2005). The five-year project is intended to be the first stage of a 15 year research programme designed "to bring the best science from around the world to bear on issues related to coral reef vulnerability and resilience.... Scientists will translate this knowledge into tools and policies for decision-makers" (World Bank 2004). The programme intends to establish "centres of excellence" in Mexico, Tanzania, and the Philippines, twinning these with existing centres in Australia (ibid).

THE US INFLUENCE

Another key player in ICRI is the US government, which has a policy of providing leadership to reduce global threats to coral reefs. Its national coral reef action plan states that the US will continue to exercise global leadership in shaping priorities and approaches that conserve coral reefs, through international technical and development assistance, capacity building and collaboration (Table 16). This plan also states that the US will continue to lead scientific efforts to improve information on the causes, occurrence and impact of bleaching and disease throughout the world (United States Coral Reef Task Force 2000a p. vi, 29).

The US government has been ICRI's main funder. When founding partners made their initial contributions, the US' was the largest (USD 175,000) (Drake 1996 p. 283). It also gave USD 680,000 to coral reef projects in 1994/5, in the hope of encouraging other donor partner countries to follow suite (Drake 1996 p. 283). Furthermore, the US government helped fund GCRMN's establishment (Table 14) and continues to fund the global coordinators' role. It spends approximately USD 2 million annually supporting ICRI or ICRI-initiated coral programmes such as GCRMN and local workshops on reef protection and management (US Department of State 2004).The government also supports coral reef initiatives run by the secretariats of multilateral agreements, through the CITES-US Cooperative Fund for example.

TABLE 16: USCRTF NATIONAL ACTION PLAN TO CONSERVE CORAL REEFS, 2000

Key elements of the international conservation strategy:

- strengthen international conventions and foster strategic partnerships with other countries, international organizations and institutions, the public and private sectors, and non-governmental organizations to address international threats to coral reef ecosystems
- strengthen the International Coral Reef Initiative and implement its Renewed Call to Action; support the Global Coral Reef Monitoring Network and its linkage to the national monitoring effort
- provide assistance in managing and conserving reef ecosystems and their watersheds in the Wider Caribbean, the Pacific, Southeast Asia, East Africa, and Middle East regions
- support the creation and management of coral reef marine protected areas, particularly those that contain substantial ecological (i.e., no-take) reserves
- strengthen international research, monitoring and assessment efforts aimed at understanding, predicting, preventing and responding effectively to the impacts of large-scale phenomena such as bleaching and disease, and their socioeconomic impacts
- analyse and address unsustainable and destructive fishing practices and unsustainable international trade in coral reef and mangrove species

Recommendations to reduce the impact of international trade:

- continue consultations with coral exporting countries and other stakeholders to assess the nature and extent of the problems associated with trade in coral reef species, to express US government concern about this and discuss possible approaches to mitigate the negative impacts of the trade
- expand capacity-building efforts in countries with coral reefs to enforce relevant laws and regulations, collect trade data, assess the status of reefs, evaluate the impacts of extraction of reef resources, develop and implement sustainable management plans
- consider developing certification schemes and institute alternative and environmentally sound collection practices and alternatives, such as aquaculture and coral farming
- improve domestic law enforcement of illegal coral reef species trade
- work with various stakeholders to develop public education and awareness materials aimed at reducing unsustainable harvest practices
- work with the marine aquarium industry and various stakeholders to eliminate destructive collection practices and reduce mortality during handling and transportation of coral reef species
- provide additional measures as appropriate to ensure that US consumer demand for marine aquarium organisms does not threaten the sustainability of coral reef species and ecosystems.

Excerpts from the United States Coral Reef Task Force (2000a).

Furthermore, the US government has sought to influence coral reef policy through its overseas aid programme, spending approximately USD 20 million annually on bilateral assistance for coral reef projects. In 2004, USAID was supporting coral reef projects in around 30 countries, mostly in Latin America, Caribbean, Asia and the Pacific. These projects aim to establish marine parks and reserves, promote sustainable tourism and fisheries, and generally improve reef management (USAID 2004). Additionally, USAID's East Asia and Pacific Environment Initiative, which ended in 2002, supported a

large programme designed to stop destructive fishing practices in Southeast Asia (which funded much of IMA's work). The US government also channels some funding for international projects through NOAA's Coral Reef Conservation Grant programme.

Despite the papers published about the US role in creating ICRI, and the USCRFT material posted on the Internet, it is not clear which individuals within the several government departments involved have had key roles in influencing (as opposed to being involved in disseminating) the US government's policy on coral reef management around the world. I made a careful but unsuccessful search for relevant published articles using the Proquest databases, which suggests there are no published academic analyses of US coral reef policy.

SCIENTIFIC INFLUENCE

As Chapters Five and Six showed, scientists have been key sources of concern about the health of coral reefs and have brought the crisis facing reefs to international attention; they have also been central in processes conceptualising and conceiving, framing and advocating international coral reef policy. Thus, the division which Litfin (1994 p. 4) and others make between research scientists and knowledge brokers (those who frame, interpret and communicate scientific knowledge to policy makers) seems irrelevant. So too does any division between science and policy, since scientists clearly undertake both roles, both individually and as professional groups, and in their written work and oral statements.

Statements and briefing papers issued by the ISRS illustrate this. The society has the joint objectives of producing and disseminating scientific knowledge and understanding of coral reefs. It has, over the years, issued 'scientific consensus statements' on diseases on coral reefs, coral bleaching and 'briefing papers' on fishing, water quality and marine protected areas. Although the former summarise knowledge from scientific research, the latter clearly combine scientific ideas and policy. The briefing paper on fishing for example, summarises what the society believes to be the ingredients of appropriate and sustainable fisheries management (ISRS 2004). These briefing papers are one of the means by which science/policy experts have sought to link coral reef science and policy. They are, by no means the sole tool used however.

Another method scientists use to try and influence coral reef policy is by publishing scientific (ie science/policy) papers, for example Wilkinson's 1992 paper discussed in Chapter Six. In a more recent example, Bellwood *et al.* (2004) published an article titled *Confronting the coral reef crisis* in the journal *Nature* to coincide with the 10th International Coral Reef Symposium; *Nature* highlighted the plight of reefs on its cover that week. Bellwood *et al.* make four management recommendations:

- a huge increase in the rate and size of no-take areas;
- improved management measures for the vast majority of reefs heavily affected by people, incorporating regional-scale management of functional groups to support reef resilience;
- making reef management more inclusive, proactive, and responsive, using governance systems that support ownership and empowerment of users as stewards; and
- reforming markets to incorporate economic incentives that prevent exploitation of species in critical functional groups.

Some researchers write consultancy reports (e.g., the Pew Centre report on coral reefs and global climate change discussed in Chapter Six). Many make press statements about their work in ways designed to bring attention to the plight of coral reefs, making specific policy recommendations. I describe one such example, concerning a paper in *Ecology Letters*, in the next chapter. That example illustrates how scientists use the media not just to publicise their research but also the mission of saving coral reefs. Rather than directing their messages to specific decision-makers, many individual scientists use media that make their views available to those interested enough to search them out.

These science policy/experts are found filling professional roles in various organisations involved in policy (whether state, intergovernmental or NGO). They are on the ICRI-CPC; in the IUCN's specialist commissions (described in the box below); and involved in forming or running NGOs. For example, a small group of scientists created the Society for the Conservation of Spawning Aggregations in 2000, to try and improve management of reef fish spawning aggregations, those aggregations being vulnerable to overfishing especially if targeted (the society's web site, with its policy statement, is located at www.scrfa.org/). Some of this NGO's members, scientific researchers, are also members of the IUCN's Species Survival Commission, and the society has been able to gain international attention for its policies through this link—a deliberate strategy.

INTRODUCING THE PLAYERS: 13. IUCN-WORLD CONSERVATION UNION

The IUCN was funded in 1948 following an international conference in Fontainebleau, France. Neither an NGO or a IGO, it describes itself as a green web of partnerships sharing a vision of a just world that values and conserves nature. IUCN has 1000 members drawn from 140 countries; these include 77 states, 114 government agencies, and 800-plus NGOs. Members meet every three to four years at the World Conservation Congress (the Union's General Assembly) to guide the Union's policy and approve its programme. IUCN's structures resemble those of intergovernmental organisations. Its secretariat, headed by a Director-General, is based in Gland, Switzerland. Governance is carried out by a Council elected at the Congress. IUCN has 1000 staff, 100 at its headquarters, the rest at offices in 42 countries in Africa, Asia, The Americas and Europe. Six commissions provide guidance on conservation knowledge, policy and technical advice; these consist of expert volunteers entrusted to develop and advance the institutional knowledge, experience and objectives of IUCN. More than 10,000 scientists and experts volunteer their services to the Species Survival Commission, World Commission on Protected Areas, Commission on Environmental Law, Commission on Education and Communication, Commission on Environmental, Economic and Social Policy, and the Commission on Ecosystem Management. The IUCN claims that the databases, assessments, guidelines and case studies prepared by its members, commissions and secretariat are among the world's most respected and frequently cited sources of environmental information.

Source: web site at www.iucn.org

The influence of science/policy experts on international coral reef policy is thus widespread and pervasive, even more so than depicted in Chapters Five and Six. These experts work in a variety of organisation types, employing a range of tools that marry science with policy. Subsequent chapters continue to explore the nature and extent of their influence, particularly Chapter Eight which examines expert discourse, and Chapters Eleven and Twelve which examine particular Fiji case studies concerning NGOs and CITES.

NGOS AND THEIR INFLUENCE UPON ICRI'S POLICY PORTFOLIO

When ICRI was being formed in 1994, its steering group held discussions with some NGOs, then decided to work with representatives from governments and IGOs since the latter were able to contribute to planned international workshops (Mieremet 1996 p. 310). Nevertheless, NGOs have become part of the ICRI community. WWF (described below) had been an ICRI member since it helped create ICRAN and MAC; in 2004 the ICRI-CPC began deliberately drawing other large conservation NGOs into the network, recognising their international influence.

INTRODUCING THE PLAYERS: 14. WORLD WIDE FUND FOR NATURE (WWF)

Founded in 1961, the World Wildlife Fund (the organisation's original name) has grown into the world's largest privately financed international conservation organization, with around five million members, and projects in 100 countries. Its purpose, only modified slightly since being laid down in 1961, is to conserve the natural environment and ecological processes worldwide. It is an independent foundation, registered under Swiss law, with a secretariat (WWF International) in Switzerland, and is governed by a board of trustees under an international president. WWF describes itself as a global organization acting locally through a network of family offices employing around 3800 people worldwide. WWF International includes managers of policy, global thematic programmes and geographic regional programmes. WWF offices around the world carry out local conservation: practical field projects, scientific research, advising local and national governments on environmental policy, promoting environmental education, and raising awareness of environmental issues. Each independent office contributes funding to WWF's global programme. WWF's international budget is equal to that spent by most countries on environmental issues and is more than three times the size of UNEP's. Fifty-five percent of WWF's income is donations and legacies from by individuals. The WWF organisation seeks policy changes at a myriad of levels from household and community to state and intergovernmental. It has two specialist policy offices, one in Brussels working to influence European Union' policies and one in Washington DC concentrating on macroeconomic policy in global institutions such as the World Bank. In 2000, WWF spent six percent of its USD 364 million budget on policy, and in 2002 four percent.

Source Moses (1994); Wapner (1995; 2003); Davis (2001; 2002a; 2002b); WWF (2004)

The GCRMN is also seeking to strengthen its links with international environmental NGOs (GCRMN report in International Coral Reef Initiative 2004). Consequently, as well as the states and IGOs instrumental in setting up and running ICRI, there have now NGOs in the ICRI network, a key one being WWF, an ICRAN partner with over a hundred coral reef projects in more than 30 countries, costing millions of dollars US (Davis 2002a, 2002b; WWF c.2003a). IUCN acts as a link between NGOs and ICRI; IUCN's portfolio of coral reef projects, launched in 2004, helps bring new ideas onto the international agenda, such as the concept of encouraging reef resilience, discussed above.

Of the six NGOs playing active roles in ICRI, three (MAC, CORAL and Reef Check) were specifically set up for the purpose of saving coral reefs and three are international environmental NGOs that existed prior to recognition of worldwide coral reef degradation (WWF, TNC and WRI). The three NGOs set up specifically to address the coral reef crisis have had their particular policy approaches woven into ICRI's. WWF has been at the forefront of bringing market-based approaches such as MAC's scheme into ICRI's policy portfolio, in the belief that the private sector has a vast potential to become a major, if not the leading, force for conservation (Bunting and Meyers 2002).

Furthermore, NGOs are collaborating in advancing, in new directions, ideas already incorporated into the *Call to Action*, as seen in efforts to develop global standards for the LRRFT (described in the box below). In Chapter Twelve, I discuss how the Fiji Government has been involved in this standard-setting process (out of which IMA subsequently opted).

GLOBAL STANDARDS FOR THE LIVE REEF FOOD FISH TRADE (LRFFT)

In February 2001, a group of 17 people from organisations with a broad conservation interest in the this trade met in Hawaii to review their efforts to improve that industry TNC, IMA, and WRI convened the workshop, and the MacArthur Foundation sponsored it. Those present, a mix of scientists, resource managers and representatives from industry and private foundations, sought ways of building on their organisations' respective strengths. They synthesised their existing strategies into a collaborative strategy to address threats to the trade stemming from destructive fishing methods and overfishing. Deciding to develop global standards for this industry collaboratively with stakeholders, they drew upon MAC's experience in developing standards for the marine ornamentals trade, and set out to develop voluntary standards covering all aspects of the LRRFT including capture and culture. Financial support for this came from the Asia-Pacific Economic Cooperation (APEC) Fisheries Working Group, the US Department of State, the MacArthur Foundation and the Packard Foundation

Source: Graham (2001 p. v-1); Kusumaatmadja *et al.* (2004 p. 30)

Conservation NGOs are leading the application of expert policy technologies to coral reefs and other ecosystems, an example being how the market-based philosophy of WWF-US's Conservation Finance Centre prompted MAC's scheme. Policy ideas developed within conservation NGOs, such as finding the root causes of biodiversity loss (Chapter Two), ecoregion planning (Chapter Two, discussed in the text box below), learning portfolios and social contracts (Chapter Twelve), are reshaping the face of international conservation and are being applied to coral reefs in several parts of the world. Most of these have yet to incorporated into ICRI's *Call to Action*, however.

WWF AND ECOREGION CONSERVATION

WWF adopted its ecoregion approach in the late 1990s when all large international conservation NGOs were searching for ways to increase funding. Past approaches—creating protected areas, species survival plans, integrated conservation and development projects run as isolated units—were delivering small rather than large-scale successes in biodiversity conservation. US-based NGOs WWF-US, CI and TNC decided they needed to scale up to conservation on a regional basis in response to the increased degradation of endangered habitats and species. Seeking large units on which to focus, they adopted the term ecoregion, already in use in American conservation programmes. 'An ecoregion is a large area of land or water that contains geographically distinct assemblages of natural communities that (a) share a large majority of their species and ecological dynamics, (b) share similar environmental conditions, and (c) interact ecologically in ways that are critical for their longterm persistence' (Dinerstein *et al.* 1995).

WWF incorporated the notion of ecoregion conservation planning based on 50 year biodiversity visions into revamped global priorities focused around a combination of global campaigns and project networking throughout the organisation (Gawler *et al.* 2000). It married its Global 200 priority-setting tool (described overleaf) with planning utilising biological and socio-economic assessments.

> Using current information, and in conjunction with partners, each [ecoregion action programme] establishes a vision for the long-term conservation of the ecoregion's biodiversity, and a set of targets which need to be achieved to reach that vision. These targets address the full range of socio-economic change necessary within the ecoregion and also in some cases contribute to the achievement of the global TDP [target drive programmes] targets. This latter feature—creating synergy between ecoregion and TDP work—is where WWF will maximize its impact, institutional efficiency and make most progress (Davis 2001 p. 15).

In marrying conservation and development through ecoregion planning WWF has come up with both a new idea about how to 'do' conservation and a new way of setting global conservation priorities. Since 2000, WWF has applied this ecoregion planning approach to several regions including major coral reefs including the Bismarck-Solomon Seas and Fiji Islands (Chapter 11).

There has not been much collaboration amongst environmental NGOs seeking to conserve reefs. Different groups have different approaches, their targets ranging through species, ecosystems, biodiversity, scenery, landscapes, and human behaviour (Redford *et al.* 2003). This reflects, in part, their diverse methods for establishing geographical conservation priorities. CI has concentrated on identifying the biodiversity of coral reefs through its rapid area biodiversity assessment programme in the 'coral triangle' (Chapter Five) (Global Environment Facility 2005). In contrast, WWF has drawn its priorities from the Global 200, a list of 238 priority ecoregions developed by staff in WWF-US's Conservation Science Programme. Seeking outstanding examples of the world's ecosystems, these staff reviewed literature on regional biodiversity and consulted scientific experts before preparing a list of representative ecoregions encompassing all biogeographical realms and ocean basins (Olson and Dinerstein 1998 p. 2). Of the 238 ecoregions, 43 are marine, half of those selected for reefs. Chapter 11 describes how WWF has furthered the conservation of one of those reef ecoregions in the Pacific.

Interpreting ICRI's Politics

THE INTERESTS EVIDENT IN ICRI

There is a degree of self-interest in the construction of the crisis narrative described in the last chapter. A group of policy staff employed by international organisations, along with some scientists (some from research organisations, some from NGOs), have publicised the notion that coral reefs are in decline worldwide and headed towards a crisis. Deliberate propagation of this narrative serves to benefit these people professionally, cementing scientists as policy experts in identifying coral reefs problems and in recommending ways to address those problems. It justifies further scientific work on coral reefs. Mechanisms like GCRMN, Reef Check, and MAC are a way for professional environmental scientists to carve niches for themselves in the increasingly competitive world of global environmentalism (cf. da Fonesca 2003, Jamison 2001). The professional interests of a small group of people with scientific training and a (self-) interest in influencing policy at an international level (a group whose membership is not necessarily fixed) are driving the work of those organisations. ICRI has provided an international stage for those efforts, in ways explored in this chapter.

Bureaucratic interests

As well as the professional interests of experts, a second form of self-interest, that of bureaucracies, has shaped ICRI's policy agenda. So too has the view that various US groups hold of that country as a rightful global leader in coral reef management. Both are discussed here.

ICRI provides a vehicle for the efforts of UN agencies to draw developing countries further into their sphere of environmental influence. UN agencies, the World Bank and GEF included, appear to be using information about the state of coral reefs and the predictions of an impending crisis in order to build mechanisms for control over both the ecology of coral reefs and the systems of human governance over reefs—control which they consider themselves best placed to manage. They are using the crisis to construct a basis for intervention. This role for IGOs, multilateral conventions included, is one that the US government has supported, as espoused in the national coral reef plan adopted by the USCRFT in 2000 (United States Coral Reef Task Force 2000a).

The authority of IGOs is legitimated not just through belief in the appropriateness of the hierarchical model of international governance, but also through the provision of technical assistance to the populations of those countries, in the form of capacity-building projects and technical assistance. The GCRM data collection network is another example of what Miller called the two way street of technical assistance (discussed in Chapter Three). The GCRMN feeds back detailed information to enable scientists and policy analysts to construct conceptual models at a global scale (albeit unsophisticated as yet for coral reefs, concentrating on determining the scale of problems). At the same time, this network helps relocalise global knowledge, transmitting and transplanting this locally relevant information back to places where reefs occur; helping recipients interpret and make sense of information (much as Miller 2004 p. 83 described for meteorological networks). I explore this further in the chapters examining policy connections with the Fiji Islands.

For IGOs, this mode of legitimating their work depends not just on the construction and deployment of global imaginaries but also on their transmission, uptake, interpretation and use in local contexts around the world (Miller 2004). Even MEAs, which have the legitimacy of their legal status, are further legitimating themselves through their capacity-building efforts. In Chapter Twelve, I describe how CITES is doing this in its interactions with the Fijian government.

Another example of how, in shaping international coral reef policy, intergovernmental organisations seek to protect their own bureaucratic interest comes from the CBD. The multi-layered organisation shaped its own international coral reef policy agenda in order to give primacy to capacity-building and technical assistance. In 1999, the year after the CBD's CoP had instructed this Convention's Executive Secretary to investigate coral bleaching (as described in the box in the previous chapter), the Secretary convened an expert consultation, a mechanism often employed by the CBD (Convention on Biological Diversity 1999; Secretariat of the Convention on Biological Diversity 1999). This consultation produced multiple recommendations which the Secretariat formatted and presented to the CoP the following year (Convention on Biological Diversity 1999 p. 25-31). Deciding to integrate coral reefs into its programme of work on marine and coastal biological diversity (commonly called the Jakarta Mandate), the CoP requested the Secretary prepare two workplans, one for coral bleaching and one for the physical degradation of coral reefs (Executive Secretary, Convention on Biological Diversity 2000a). In formulating the coral bleaching workplan, CBD staff shifted the emphasis from a scientific one to one that better suited the purpose of their own organisation—centralised control of international environmental management.

In the *ad hoc* expert consultation (a mechanism often used by the CDB), invited experts had made several recommendations that highlighted the 'unknowns' about coral bleaching (Convention on Biological Diversity 1999 p. 25-31). In the report of the consultation, there are two versions of these recommendations. The first is a table of main points and issues, conclusions and recommendations, assembled from notes taken during presentations and discussions. In the second, these have been rewritten as a set of general conclusions and recommendations, compiled into an issue and response format. The second version appears to have been reworded and reordered by CBD staff. In the official documentation (available on the CBD web site), it is not clear if the experts endorsed these

changes—nowhere in the CBD report does it say that they do. This is noteworthy because several specific scientific recommendations about information-gathering are omitted from the second summary, subsumed into general recommendations about the need for targeted research programmes, baseline assessments, long-term monitoring, along with a 'rapid response capability' to document coral bleaching and monitoring in developing countries and remote areas. Recommendations omitted include:

- monitoring crustose coralline algae and other macroalgae as indicators of reef status and resilience
- investigating the role of coral reefs as critical habitat for other species
- investigating if previously stressed reefs are more or less likely to be susceptible to bleaching
- determining ecological and socio-economic indicators of stress for use as 'early warning signals'.

The Executive Secretary presented the edited recommendations to the fifth meeting of the SBSTTA in Montreal, 31 January- 4 February 2000 (Subsidiary Body on Scientific Technical and Technological Advice 2000 p. 20-5). In the SBSTTA's subsequent recommendations to the CoP, the specific scientific recommendations of the experts are subsumed even further. The emphasis of the SBSTTA's recommendations is as much, if not more, on international liaison, partnerships, community participation, planning, finding appropriate policy responses, capacity-building, and public education as it is on scientific research and monitoring. The sense of coordination that the experts sought in their recommendations is watered down to joint actions between MEAs—CBD, UNFCCC and Ramsar. The sense of coordination needed to address the 'unknowns' is lost; it is transformed into coordination on matters of policy, capacity-building and financing. As a result, there is a considerable difference between the tenor of the SBSTTA's recommendations and the original conclusions and recommendations of the expert group. In effect, the CBD staff through their drafting of reports and briefing papers, altered the recommendations of the experts to make them express the need for international liaison, partnerships, planning to find appropriate policy responses, capacity-building, public education, and community participation. Interestingly, this list of functions in the CBD workplan parallels those identified in ICRI's *Call to Action* as needed to save coral reefs. These are functions which, in this system of governance, are best carried out by formal intergovernmental organisations, agencies able to co-ordinate cooperative efforts across national boundaries. As such, they accord with the belief in the hierarchical notion of policy based upon centralised role governance as a territorial matter (Chapter Three). In that conventional understanding of the global governance system, only intergovernmental organisations are placed to co-ordinate international efforts encompassing education, awareness-raising, and capacity-building, research and monitoring.

The bureaucratic interests that large international organisations involved in coral reef policy matters, whether within or outside the UN system, have in preserving their ability to operate in a world of competitive funding for efforts to transfer western-style environmental policy to developing countries can also be seen in the way that various organisations used the vehicle of ICRAN to bid for funds from the UN Foundation. Moreover, the argument that bureaucratic interests are shaping ICRI's policy

portfolio is as applicable to international NGOs as it is to IGOs such as the CBD. ICRI has provided a stage for organisations outside the formal intergovernmental system, enabling them to gain or cement an international profile as significant players in conservation and sustainable environmental management, helping assure their funding base and thus their self-preservation.

ICRI as a stage for new ideas

In the work of NGOs on coral reef matters, there is clearly another type of interest shaping policy approaches, that of the professional expert. The policy ideas of experts working in NGOs reach the international policy agenda relatively quickly. There is, in the way that those organisations operate outside the formal state and IGO system to promote new ways of doing coral reef conservation and in the way that they seek to maintain this role, an element of both bureaucratic (organisation) interest, and of the professional self-interest of the experts working in them. This is somewhat paradoxical. NGOs, rather than IGOs have been the source of new ideas about 'doing' coral reef conservation, precisely because they lack the bureaucratic interest of IGOs. Their less formal organisation allows professionals to push their ideas onto international policy agenda far more quickly than if they worked in UN agencies.

In developing new approaches such as ecoregion planning, and in using these practices at multiple sites around the world, WWF and other major US-based conservation NGOs are making their organisation not just a significant but an indispensable player in the race to save coral reefs and other endangered ecosystems (much as Brosius 2004 discussed—see Chapter Three). By establishing themselves as experts in those policy technologies, and ensuring they are taken for granted as methodological gatekeepers, they consolidate WWF's authority over global conservation practices. ICRI provides a stage for some of those ideas.

But, while MAC with its certification scheme, the WorldFish Centre with its global database ReefBase, and WRI with its risk assessment tool *Reefs at Risk*, have all relied on the ICRI network to legitimate their particular technologies, the older conservation NGOs have not. With their international profile, substantive funding bases, and favourable media profiles for their environmental work, they have able to do this themselves. Thus, some of the expert policy technologies which NGOs are designing and using have yet to become part of ICRI's policy platform, even when the NGOs responsible are part of ICRI. This reflects how major conservation NGOs have sufficient funding bases and authority to propound these new policy technologies without needing to draw upon the authority of ICRI. To them, ICRI is a useful, but not a key, platform for their policies. I return to this phenomenon in Chapter Eleven, which examines conservation NGOs working in the Fiji Islands.

US interests

By funding ICRI, the US government has been able to get its policy ideas onto the international agenda; claiming itself as a world leader in coral reef policy, a position not supported by the small area of reefs under its governance. As the following text box shows, the US government has sought to remake, in its favour, definitive figures on the proportion of the world's coral reefs that occur within the waters of each country, thus increasing the legitimacy of its self-assigned role of world leader.

The government, in its national coral reef action plan, attempts to legitimate its interests in leading world coral reef policy, asserting that the US has "strong political and economic interest in protecting international coral reef ecosystems":

> Healthy marine ecosystems are critical to US diplomatic and development strategies to promote economic and food security, social stability, democratic governance, improved human health, disaster and climate change mitigation, and biodiversity conservation in many countries (United States Coral Reef Task Force 2000a p.1).

The plan goes on to link the ecological health and economic benefits of US coral reefs directly to reef habitats in other countries, suggesting that the currents bathing the Florida Keys originate in the wider Caribbean and along the Central American coast, and (more tenuously) that the coral reefs of many of US Pacific territories are connected to other Indo-Pacific reefs (United States Coral Reef Task Force 2000a p.1). If this is an unconvincing argument about why the US should take an interest in global coral reef policy, then efforts to justify this on the basis that the US administers significant areas of coral reefs comparative to other countries are patently overblown, as the following text box illustrates.

Within the US there are multiple groups interested in coral reefs, multiple policy agendas, and conflicting views on several issues including climate change and the acceptability of the marine aquarium trade (Best 1999, also *pers. obs.* at the 10th International Coral Reef Symposium, Okinawa, and also on Coral-List). Also, as Miller (2001) noted, over the past fifty-plus years, the State Department has lost much power and authority over the conduct of US foreign policy, with international politics becoming the domain in which a wide range of experts from numerous government agencies. These experts have created opportunities for the development of transnational communities (Miller 2001 p. 210-212). This situation has provided an opportunity for scientific experts working in certain government departments (such as Andy Bruckner (a coral trade expert in NOAA) and Barbara Best of USAID) to become part of the international political assembly around coral reefs without having to be part of 'official' State Department foreign policy diplomacy.

It is not clear how those tensions play out in efforts to make the US a global leader in coral reef policy. This is a matter deserving of analysis, but beyond the resources of this particular study. Rather than treating the US as a single bloc of political interests, those interests should, at some stage, be identified and their interplay described, taking in account the retreat of President George W. Bush's administration from the business of global environmental protection.

THE US: REWORKING THE STATISTICS FOR THE AREA OF CORAL REEFS IN ITS JURISDICTION

It is a difficult to determine the actual extent of coral reefs. UNEP-WCMC's *World Atlas of Coral Reefs* (Spalding *et al.* 2002), as the only published source of comparative data on reef area in each country and region, has considerable authority in this matter. A press release accompanying the atlas's publication ranked the US as having the 16th largest area of reefs worldwide, a total of 3,770 square kilometres constituting 1.33 percent of the world total (including Florida and Gulf of Mexico, Hawaii, American Samoa, Puerto Rico, US Virgin Islands, and Guam) (UNEP 2001c). The press release lists Indonesia, followed by Australia and the Philippines as having the most reefs by area, while France comes in fourth. The Republic of Fiji has the sixth largest area; 3.52% of the total. Even the UK, through its overseas territories, had more reef area than the US (5,500 sq km). Yet, NOAA is distributing a brochure that records the US share of all the world's reefs as 10 percent (I picked this up at the International Coral Reef Symposium at Okinawa in 2004). The brochure states the extent of US coral reefs as 7,577 sq miles (19,624 sq km) (US Department of Commerce National Oceanic and Atmospheric Administration 2002 p. 1). In deriving these figures, NOAA appear to have calculated the extent of US reefs using a different method to that used in the *World Atlas*, without giving the same attention to recalculating reefs in all other jurisdictions. Much of the difference between the *World Atlas'* and NOAA's figures appears due to a massive increase in the estimated area of reefs in the northern Hawaiian Islands described in NOAA's 2001 'state of the coast' exercise.

Several factors may have contributed to these very different calculations of reef area. First, lack of a single, uniform definition of what constitutes a reef is the primary problem plaguing attempts to quantify the area of reefs worldwide. Spalding and Grenfell (1997, p. 228) estimated that reef area statistics could vary by an order of magnitude depending on the definition used. A second difficulty is that of scale, especially combining information from maps created using different scales and formats. Spalding and Grenfell (1997 p. 228) found that using maps at different scales greatly affected calculations of reef area statistics. Large-scale, high resolution data are likely to show a greater number of small reefs, increasing total reef area. Maps prepared at smaller scales show less small reefs, simplify reef demarcation and underestimate area (Spalding and Grenfell 1997 p. 226).

A third problem arises because many coral reefs on shelf areas do not break the sea surface, and are difficult to detect and to map (Smith 1978; Moses 1994; Munro 1996). Different detection methods therefore produce different area calculations. There is some evidence that coral communities are widespread on continental shelves, some being known only because of bottom sampling or material caught in nets or dredges (McManus 1997; Munro 1996). What proportion of these deeper water corals photosynthesise is not known and there is no easy way to distinguish this when mapping the extent of coral reefs. Yet most definitions of coral reefs exclude non-photosynthesising corals. This was not a problem until improved sensing and scientific techniques permitted these deeper reefs to be located (Kleypas *et al.* 1999). Where exactly does one define the limit between photosynthesising and non-photosynthesising corals, in order to map them? For all these reasons comparative figures produced using a consistent method have far more meaning than any single estimate of the extent of reefs in any particular locality.

Control over environmental terms of trade

US economic interests in coral reefs centre on trade, shown by the prominence this was given in the USCRTF's investigations (see the policies in Table 16). During the USCRTF investigation in 1998, it became clear that the US market has driven the rapidly expanding international trade in live coral and live rock (Trade subgroup of the United States Coral Reef Task Force 2000 p. 5). Other key markets are in Europe and Japan (Chapter Five). Yet, in most of its own waters, the US either prohibits or strictly limits the harvest of corals because of the key role these play in the ecosystem and because of widespread concern that the organisms are vulnerable to exploitation (Bruckner 2000).

In effect the US, in alliance with other key importers and Canada, is seeking to control the environmental terms on which international trade in coral reef organisms is conducted. By providing the largest slice of funds for GCRMN and ICRI, the US government maintains a strong grip on international coral reef policy, which is advantageous in addressing future tensions that may threaten its economic interests in this international trade. The US government, through the US Technical Cooperation Trust funding for CITES, has funded much of that convention's work on bringing non-complying countries with a significant trade in corals into line with the convention's requirements (Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora 2001 p. 9). It has also funded much of the work on destructive fishing undertaken in the Philippines and Indonesia (as described in the box introducing IMA in Chapter Five). There is, in effect, a western bloc (including Japan and Hong Kong) which is ensuring that international trade in coral reef organisms is conducted on environmental terms which allow the trade to continue (i.e. on an acceptably 'sustainable' basis) and continues to profit those who have invested in it. Chapter Twelve investigates this further.

ICRI AS A FORM OF NETWORK: A MODALITY OF POWER

To recap, this analysis has highlighted how IGOs, NGOs and the US government have different but overlapping agendas; it has shown how ICRI is an expression of the bureaucratic interests of IGOs in preserving their ability to operate as well as a stage for new ideas that experts have about environmental protection and conservation. ICRI is also a way for the US to assert leadership in international environmental policy, a dominance which France is beginning to challenge as it establishes large multi-agency programmes in its overseas territories. One can understand ICRI as a coalition of these interests, a concept that combines the idea of policy being produced by communities of experts with Dobuzinskis' notion of it being the outcome of multiple self-interested decision-makers seeking to maximise power and influence, plus March and Olsen's notion of policy as a garbage can, ideas thrown in and stirred together (Chapter Four).

But ICRI is not simply an alliance emerging out of a disparate set of agendas, interests and agencies, a tool legitimating pre-existing political agendas. ICRI is a new form of network: groups of people have sought to construct new sets of connections, to enrol actors from around the world, and to multiply the network's sphere of influence. As a result, the network has expanded in several facets. It is, for instance, gradually incorporating not just conservation NGOs, but the expert policy technologies they

invent and deploy through projects in various countries. As the network's policy agenda has expanded, so too has its capacities, its means of shaping policy around the world.

Furthermore, creating ICRI has created new modalities of intervention. Morozova (2000) argued that creating ICRI was "... the only plausible solution for overcoming the 'disjointed incrementalism' in international policy-making, which is insufficient to deal with the complexities of international problems on the agendas of national decision-makers". Morozova saw ICRI's power lying in its ability to co-ordinate extensive international activities across national lines, in its capacity to co-ordinate and inform decision-makers across regions, and to gather and collate information about what is happening in various regions. According to Morozova, ICRI was organisationally effective because of its focus on action (providing information and monitoring rather than enforcing policy), and because it was relatively flexible, able to locate relevant players at local and national levels and to direct their efforts towards achieving a set of core goals. This interprets ICRI as an informal way for these agencies to further their work without requiring another formal convention or agreement to do so. ICRI's informal organisation gives them more flexibility in how they act; it involves far less bureaucracy than if an intergovernmental agency was attempting it.

This interpretation is simultaneously insightful and weak. It is an orthodox interpretation, resting on the norm of effectiveness, an expression of postinternationalism (the latter discussed in Chapter Three). As such it is a functional, and therefore weak, explanation of why groups cooperate in arrangements such as ICRI. At the same time it focuses attention on how, even though the interests involved appear much stronger than the organisation they jointly create, creating a network such as ICRI is a strategic action designed to take advantage of the political power that such networks have.

For ICRI is more than a coalition of interested parties who act in a mechanical way to attain status, enhance symbolic capital, protect their interests, or gain and maintain power (cf. Hess 1997 p. 162). ICRI is collaboration in the form of a network. Within networks, interests are dynamically constructed; actors do not come into networks with pre-existing interests that simply 'play out' (Holm and Kendall 2002 p. 43). Networks have their own politics. There is also a strong element of indeterminacy in networks; they contain within them possibilities or unexpected consequences (Holm and Kendall 2002 p. 56).

CONCLUSION

Networks are political as Latour (1999 p. 2) concluded, their strength coming from their links and connections with that outside the network, from their heterogeneity and from "the careful the plaiting of weak ties". They create strategies of power, as Morozova's interpretation of ICRI highlighted. Furthermore, as the ICRI network extends its sphere of influence, enrolling IGOs and MEAs, NGOs and projects, philanthropic funders and UN funds, reefs and people from a variety of locations around the world, it redefines interests. Network politics are not merely alliances, and network interests not merely the pre-existing ones of alliance members. Here, Latour and Weibel's (2005) descriptions of the nature of politics and political assemblies in contemporary society are helpful. ICRI is a political assembly around the notion of a crisis facing coral reefs worldwide. The ICRI network connects people

in a political assembly "no matter how much they don't feel assembled by any common politics" (Latour and Weibel 2005).

But, as I emphasised in Chapter Four, it is important to look at international policy both as the output of networks and as part of discourse. In the next chapter I return to the latter concept, analysing the narratives and metaphors shaping international coral reef policy. Building on the insights in this chapter and the preceding two, this gives a rich, nuanced picture of how the 'international' component of coral reef policy arises.

Chapter Eight

Narratives and Metaphors Shaping Coral Reef Policy

Introduction

Having analysed the ICRI network as a political assembly around the notion of a coral reef crisis, I now examine how 'expert' discourse constructs the survival of coral reefs as being dependent on the interventions of those forming this assembly. Interrogating standard storylines and metaphors found in expert-produced coral reef texts, I show how these discursively create the need for such intervention in developing countries. This interrogation also reveals the efforts of coral reef science community to maintain a sense of hope for and control over a natural world comprehended as complex, by advocating policy prescriptions based on exceedingly simplistic notions of the human world.

Binding Coral Reefs into a Universal Problematic State

A key characteristic of global environmental policy discourse is the way in which it portrays the environment as a problem of global scale. The crisis narrative does this for coral reefs, enrolling all reefs into a single universal (global) problematic state, thus necessitating a global-scale effort to address the problems facing them. There are other discursive mechanisms common in expert-produced texts that serve the same purpose and these, too, are characteristic of the discourse of global environmental policy described in Chapter Two.

METAPHORS USED TO DESCRIBE CORAL REEFS

Recurring representations (metaphors) create coral reefs as problematic ecosystems worth focusing attention and resources upon. These metaphors follow the central idea that reefs are valuable—treasures that are the common heritage of humankind—yet vulnerable and/or fragile and

therefore in need of protection from and by humans. These metaphors serve to bind all coral reefs, regardless of biogeography, history and degree of human impact, into a universal state. They are found in a range of sites including popular articles, news reports, NGO literature, conference speeches and declarations and are commonplace in scientific writings.

One metaphor commonly used to describe coral reefs is the notion they are the 'rainforests of the sea' (e.g. Mulvaney 1997). This comparison appears to have originated in a paper that Connell (1987) wrote for *Science*, titled *Diversity in tropical rainforests and coral reefs, comparing rates of ecosystem productivity*. Coral expert Charlie (JEN) Veron, author of the most comprehensive texts on coral taxonomy, biogeography and evolution, also mentions this comparable productivity. "Most coral reefs exist in environments poor in inorganic nutrients such as phosphates, nitrates, and iron, yet they have a productivity that is similar to rainforests" (Veron 1986 p. 46). There is a second reason coral reefs have been called 'rainforests of the sea'. This reflects the idea that rainforests and coral reefs are both self-sustaining ecosystems. As Veron (1986 p. 30, 46) explained, although reefs import and export nutrients (e.g. as fish), trade with surrounding sea is small compared with their own internal recycling. Coral colonies and their zooxanthellae may absorb dissolved nutrients from seawater or obtain them from food captured by polyps. Since the reefs themselves only receive low levels of these nutrients from the surrounding ocean, they must have a great capacity to conserve and recycle nutrients, involving many self-regulating processes that make up the nutrient cycle of reefs. In an article in *Ecology Letters*, Dulvy *et al.* (2004 p. 415) sought to extend the metaphor by comparing the rate of decline of coral reefs worldwide with the rate of felling on rainforests. "The rate of coral reef loss at least in some parts of the world, is proceeding at a rate similar to or in excess of the rates of rainforest clearing".

This analogy between rainforest and coral reefs conveys the basic message that both are diverse systems suffering from human impacts, and are worthy of protection and conservation. But as contributors to a discussion on this subject conducted on Coral-List pointed out, when specifics of the two ecosystems are compared, the differences begin to outweigh the similarities. For instance, tropical rainforests are richer in species and have higher canopies but reefs have a greater gross productivity. Species diversity and interaction are different between the two ecosystems, as is recruitment. In a reef environment, broadcast spawning ensures widespread dispersal of coral larvae. In a rainforest environment, however, successful seed dispersal and germination is dependent on a number of sensitive circumstances. Reefs and tropical rainforests also differ significantly in taxonomy (Coral-List 2000). What is interesting is that scientists seriously entertain the validity of this analogy, in spite of those differences; the metaphor is a catchy 'sound bite' meant to garner attention from a public more aware of rainforest degradation than threatened coral reefs—an educational tool (Coral-List 2000).

Highlighting the biodiversity of coral reefs by labelling them the rainforests of the sea is an attempt to establish the value of coral reefs. So too is the label 'treasure'. "Coral reefs and associated ecosystems are invaluable human resources"—so begins the Okinawa declaration on conservation and restoration of endangered coral reefs of the world, prepared by participants at the 10th International Coral Reef Symposium. (The declaration was drafted by a small group, made available on a table in the display area throughout the conference and 'approved' by those remaining at the very end of the final plenary

session). This metaphor also appears in a World Bank press release in November 2004, announcing a USD 23 million dollar project to create three centres of excellence in coral reef science: "These Centres will serve as regional hubs.... To improve the management of these beautiful, economically viable—and threatened—treasures" (World Bank 2004).

The notion that coral reefs are fragile has been one of the most persistent representations of coral reefs in the last thirty or so years. In the 1970s and 1980s several well-known coral reef scientists, Johannes (1975), Endean (1976) and Salvat (1980) included, suggested that coral reefs are stable communities in delicate balance with nature. To these scientists, coral reefs were stable and predictable biotic associations because of the presence of a variety of buffering systems that protect the community against large scale destruction (Endean 1976). To them, coral reefs were also fragile, for two reasons. First, because of specific trophic relationships, any species injured was believed to have an immediate effect on all others. Second, because species have a narrow habitat range, any slight change in conditions such as temperature, salinity, turbidity, or dissolved oxygen was thought likely to cause ecological disaster (Salvat 1980 p. 341). Sorokin (1993 p. 407) wrote in a scientific text on coral reefs: "reef ecosystems exist at their boundary of endurance of physical stress".

This concept of coral reef ecosystems is based upon equilibrium theory favoured by ecologists at that time (Chapter Six). It incorporates cybernetic ecology's notion of a system with negative feedback loops, and its notion of threshold limits, beyond which is disaster (Chapter Two). Both Johannes and Endean suggested that when a reef community is disturbed or destroyed, then the reef would probably never recover to its former state. This is cybernetic ecology's notion that apocalypse results when we fail to maintain the delicate control mechanism and cause breakdown.

In both scientific literature and in the science-based policy literature, this dominant representation of coral reefs is in the process of undergoing a shift. Coral reef ecosystems do not seem as fragile to scientists as they once did and according to M^{c}Clanahan *et al.* (2002), the concept of a redundancy amongst species maintaining ecological processes when individual species decline is widely accepted amongst the coral reef science community. In the absence of human impacts, coral reefs are regarded not as fragile but as naturally resilient; in the face of anthropogenic activities and climate change, they are now labelled 'vulnerable' and in need of managing for this 'resilience'. Moreover, policy attention is shifting towards finding ways of managing reefs that strengthen their resilience to the increased frequency and intensity of pressures arising from human activities (M^{c}Clanahan *et al.* 2002). Among the organisations now seeking to encourage reef resilience are the World Bank, IUCN, NOAA, Wildlife Conservation Society (WCS), The Nature Conservancy, and the Great Barrier Reef Marine Park Authority (Sherwood 2004; World Bank 2004). In the 2004 GCRMN global status report, the concept was added to the standard GCRMN/ ICRI prescriptions for saving coral reefs (Chapter Seven).

In this concept of resilience, nature in still need of rescue but we have concrete proposals about how to rescue it, reflecting faith in humankind's capacity for controlling nature and keeping ecosystems below the thresholds for breakdown. This concept of resilience derives not from cybernetic ecology's notion of a single state of equilibrium but from evolutionary ecology's theory of multiple equilibria (Scoones 1999). It comes from the work of CS Holling who has concentrated on changing how humans manage

ecosystems. Holling aims to foster a wider appreciation of complex dynamics, uncertainty and surprise, and advocates 'adaptive management' (see text box following).

THE 'NEW ECOLOGY' AND ADAPTIVE MANAGEMENT

The representations of nature underlying this shift towards reef resilience derive from evolutionary ecology, in which the human relationship with nature is not the instrumental one of cybernetic ecology but a strategic one; management of ecological systems becomes a matter of strategy or even tactics (Kwa 1986 p. 181). These representations also derive from CS Holling's work on adaptive management. Holling (quoted in Kwa 2002 p. 40) sought to promote a particular view on the management of natural systems, one which allows persistence by maintaining flexibility above all else. This is the basis of the theory of adaptive management of ecosystems, now seen as an alternative to the standard managerial approaches to intervention favoured by cybernetics and equilibrium ecology.

Holling's work dates back to the 1970s, but came to prominence in the 1990s (Scoones 1999). His view of ecosystems was inspired in part by French mathematician René Thom's theory of catastrophes (which Thom drew from chemical reaction kinetics). In this, a slight change in a single variable of a system can, under certain circumstances, give rise to sharp, discontinuous change. Holling argued that strategies to lock a system in a supposedly advantageous equilibrium can be counter-productive and produce the catastrophe they tried to prevent (Kwa 2002 p. 39). He advocated incremental responses to environmental issues, with close monitoring and iterative learning built into the process, enabling managers to respond to thresholds and surprises (Folke *et al.* quoted in Scoones 1999).

This strategy of encouraging resilience is premised on the belief that the ability of coral reefs to return to a pre-disturbance state (ie its ability to remain a coral-dominated reef) should not be taken for granted (Nyström *et al.* 2000 p. 413)—compare this to the adaptations to variable conditions described in the text box on p. 140. This belief is based on evidence for phase shifts occurring in the Caribbean-Atlantic region described in Chapter Five. The fear is that, in recent decades, shifts from one stable state to another might have become more frequent and less reversible (in other words that fear is that algal-dominated reefs will not revert to coral dominated ones sometime in the future), and that human impacts are influencing, maybe even driving, these shifts (Nyström *et al.* 2000 p. 416).

> Human modification of the marine environment might result in loss of diversity within and among functional groups (e.g. reef framework builders and grazers), leading to simplification of coral reef habitats, reduced functional plasticity and decreased ability to buffer disturbance. Coral reefs with decreased diversity within functional groups might still maintain ecological functions, but when faced with an additional disturbance they might reach a critical threshold and shift into another stable state in which large-scale degradation and loss of essential ecosystem services could occur (Nyström *et al.* 2000 p. 416).

Despite this shift towards using the metaphor of reef resilience in expert-produced texts, the fragility metaphor still commonly appears in popular articles (ie those written by journalists). This accords with Hellsten's (2002) observation that the media are conservative and slower to change their metaphors of nature than are scientists. For example, Harder (2001) wrote in the on-line *National Geographic News*: "Although many corals look bony and durable, reefs are highly fragile ecosystems, sensitive to human disturbance and environmental stress". Chadwick (1999) in *National Geographic Magazine* referred to coral reefs as fragile but biologically resilient; James (2001) in an Environmental News Network story described them as fragile; Denecke (2001) in the *UNESCO Courier* called them complex and fragile webs of biodiversity.

SCIENCE: GENERALISING IMPACTS ON CORAL REEFS

The universal nature of scientific reviews

Accounts of coral reefs published as scientific papers bind all coral reefs into a single problematic state through a second mechanism. They use the impersonal, abstracted, agent-absent style of rhetoric, and make factual claims of universal applicability regardless of human action and belief. This device can be seen in scientific reviews of the effects of certain types of events and activities upon reefs, such as fishing. These reviews generalise site-specific scientific accounts, thus creating a universal story encompassing all sites, exceptions sometimes being noted. In the last decade, there have been reviews published on several types of impact on coral reefs including the effects of fishing on reefs (summarised in the following text box), nutrient enrichment (e.g. Szmant 2002), and coral bleaching (discussed in Chapter Five).

Reviews such as Roberts (1995), quoted in the following text box, present a generalised argument about how overfishing changes reefs, drawn from observations and studies at specific sites and universalised to treat all coral reefs as potentially subject to the same problem, fishing. The review process operates as a prediction, suggesting that if reefs are fished, this is what will happen—this is Latour's "science looking forward", described in Chapter Four. There is here the same sense of inevitability found in modernisation's meta-narrative—inevitably modernisation leads to environmental degradation (Chapter Two). Other scientific reviews of coral reefs contain the same sense of inevitability (e.g. M^{c}Clanahan 2002; McClanahan *et al.* 2002).

THE EFFECTS OF FISHING ON CORAL REEFS

There is a substantive body of scientific literature discussing the evidence for various changes that fishing may cause to coral reefs. It covers such matters as the way fishing reduces the abundance and mean size of target species and causes changes in size classes. Some species may be exterminated locally, some even globally. Fishing can change the relative abundance and diversity of reef species other than those targeted (Roberts 1995). Sustained fishing with a variety of relatively unselective fishing gears can cause progressive changes in reef fish community composition, some species being more 'catchable' than others. Fishing may result in the loss of keystone species, which could lead to major effects on reef process (Roberts 1995 p. 989). Because many fisheries target carnivorous species, the abundance of whole groups of fishes such as invertebrate-feeders is thought to be sensitive to exploitation; fishing could lead to loss of entire functional groups of species (McClanahan *et al.* 2002 p. 7). Although theoretically this should impair potentially important ecosystem processes facilitated by those groups, the significance of this removal is still under debate (Roberts 1995 p. 991).

In a recent review in *Science*, a suite of authors suggested that 'dramatic' phase shifts in dominant species seen in some coral reef ecosystems (e.g. in the Caribbean, Chapter Five) are due to intensified human disturbance from previous centuries, particularly overfishing (Jackson *et al.* 2001). Pandolfi *et al.* (2003) added a further historical dimension to the narrative by using historical records to show the degradation of coral reef ecosystems began centuries ago, the trajectories of decline being remarkable similar worldwide. Large animals declined before small animals, and Atlantic reefs declined before the Red Sea and Australia, extending back thousands of years. The authors suggested the cause was overfishing, although others believe that the release of nutrients and sediment as rising sea levels flooded coastal areas, from centuries to millennia ago, also needs to be considered as a possible contributory factor (Aronson *et al.* 2003).

Reports summarising the environmental impacts of trade in coral reef organisms

There is the same sense of inevitability underlying reports about the environmental effects of global trade in coral reef organisms. Rather than explicitly calling upon the worldwide coral reef crisis, those running international projects aimed at controlling the environmental effects of trade on coral reefs generally draw upon stories outlining the adverse effects of that trade on coral reef organisms. This was the case with the two reports in the late 1990s which drew attention to rapid expansion in the international coral trade, mentioned in Chapter Five. The authors of both the WCMC report (Green and Shirley (1999)) and that of the Trade subgroup of the USCRTF (2000) drew conclusions about the sustainability of the worldwide trade. Yet neither set of authors had any data assessing the ecological effects of the trade on specific reef systems, or any monitoring data investigating its long-term

sustainability. Quoting mainly the Green and Shirley report, the USCRFT Trade subgroup (2000 p. 4) described the effects of harvesting thus:

> Commercial harvest causes localised destruction of coral reefs, including increased erosion and loss of critical fisheries habitat. Live rock is essential for the reef because it provides important habitat for motile fish and invertebrates; it provides vital substrates for the settlement and recruitment of benthic organisms; and it contributes to the structure of the reefs and to total reef biomass. The taxa harvested for curios are primarily branching corals, many of which suffered catastrophic mortalities during the unprecedented worldwide coral bleaching event of 1997-1998. In addition, coral collection for aquaria and jewellery targets a small number of species that are often rare, slow-growing and long-lived. Overexploitation of coral species could result in loss of diversity and severe localised extirpations (Green and Shirley 1999). Studies have shown that unsustainable extraction and destructive collection practices of coral and other organisms can lead to phase shifts within the coral reef ecosystem resulting in the decrease in survival or extinction of coral species.

To justify the last sentence quoted above, the authors cited papers from Maldives and the Philippines: Ross (1984) and Brown (1988). What is notable about the USCRFT Trade Group's description of environmental concerns about coral harvesting, apart from the paucity o studies quoted, is that it presents a worst case scenario as if that is the norm in all countries and localities from which corals are harvested for export. It reads as if all harvesting practices and all levels of harvesting intensity will have these effects, if not now, then eventually. The scenario it paints is presented as the inevitable result of an unregulated industry at each and every harvesting location. This overlooks the essential nature of human impacts on the coral reefs: each harvesting act has a specific impact with a specific geographical sphere of influence. The sum of impacts does not average out over the planet's surface, nor does it accumulate somehow into one mega impact; some systems may be connected through currents or larval flow, many are not. Impacts often remain localised to particular reef systems, or parts of those systems. Logically, the question should not be whether international trade *per se* is unsustainable but what level of harvesting at what places is unsustainable. The Trade Group's scenario also overlooks the various controls already in place in various countries, such as those described in the next chapter's account of reef governance in the Fiji Islands.

GLOBAL ASSESSMENTS: DRAWING THE FIJI ISLANDS INTO THE PROBLEMATIC

These metaphors, scientific reviews of types of impacts on reefs, and reports summarising the environmental effects of trade in reef organisms, serve to enrol coral reefs in various parts of the world into a single universal (global) problematic state. The initiatives collecting data on the state of reefs worldwide, described in Chapter Five, have the same effect. They take information from discrete sites and generalise it to create a picture encompassing all reef systems worldwide. In doing so, they depict places such as the Fiji archipelago as part of the global problematic.

The data on which these reports are based may be minimal, as the following example shows. The 1998 *Reefs at Risk* report judged two-thirds of Fiji reefs to be at risk from overfishing, coastal development, logging, and agricultural erosion (Bryant *et al.* 1998 p. 27). The authors suggested that, as in other parts of the Pacific, those areas near population centres face significant human pressures. Although not explicitly stated, the information used in that report to assess the reefs in the Pacific Ocean was

extremely sparse, predating efforts to accumulate data on Fiji reefs for the GCRMN status reports. The authors state that "Estimation of threats to reefs was particularly difficult for remote areas in the Pacific, which are less visible and for which global data sets tend to be less complete" (Bryant *et al.* 1998 p. 51). They do not, however, acknowledge the same difficulty exists for many less remote parts of the Pacific. They had made no effort to collect and analyse the type of information, which the authors of the first GCRMN national reports for various Pacific Island countries subsequently used. Instead, the *Reefs at Risk* authors largely derived their judgement about Fiji reefs from proxies (e.g. land cover; the location of ports, settlements, shipping lanes; plus estimates of GDP and fish consumption) and written papers.

Of the 100 references cited in *Reefs at Risk*, only two relate specifically to the Pacific Islands: these are Zann (1994) and Johannes and Riepen (1995). The latter is not relevant to the Fiji Islands, and the former is a short overview of reefs in the Fiji Islands, Tonga and Samoa, concentrating on anthropogenic effects and major issues in marine management, based on the author's unpublished studies over a fifteen year period, plus a few specific local studies of water quality and fisheries issues (Zann 1994 p. 52). The latter had not unsurprisingly concluded that, for the Fiji archipelago, the scale of impact was low in the outer islands and ocean reefs (the major proportion of reefs); low to moderate in medium density rural areas (a significant proportion of reefs on the major islands); and locally severe in urban areas (a small proportion of reefs on major islands) (Zann 1994 p. 55). This was a coarse assessment; Zann did not map population density and only mapped reef location in a cursory fashion. Thus, in relying only on Zann's paper and on proxies, the WRI assessment made the same generalised type of statement about impacts on coral reefs as did the reports on trade examined above.

Global data collection initiatives in the Fiji Islands

Not only do global assessments serve to draw places such as the Fiji Islands into the global problematic despite a paucity of data, they also serve to shape the local picture, as this examination of the GCRMN process shows. GCRMN is the main international initiative gathering data about the state of reefs in the Fijian archipelago. It is organised through a node at the University of the South Pacific (USP) in Suva (since 2000, the Institute of Marine Resources, formerly the Marine Studies Programme). The Institute operates as both the regional Southwest Pacific node and the Fiji country node. GCRMN status reports have rated the reefs around Fijian urban centres as significantly degraded from a combination of causes, stocks of certain favoured fish and invertebrates in the Fiji Islands being depleted, and destructive fishing causing serious damage in some places (South and Skelton 2000 p. 162-163; Sulu *et al.* 2002 p. 185; Lovell *et al.* 2004 340-341). Moreover, the 2000 GCRMN reportlisted several species endangered or threatened in the Fiji Islands: the bumphead parrot fish and various invertebrates—four species of giant clams *Tridacna sp.*, blacklipped oyster *Pinctada marginifera*, three species of holothurian (*Holothuria fuscogilva*, *H. scabra* and *H. nobilis*), and the giant triton *Charonia tritonis* (South and Skelton 2000 p. 169). The 2002 report stated that the bleaching episode in 2000 affected most of the archipelago's reefs and that, in 2002 there was some intense bleaching of very shallow areas (South and Skelton 2002 p. 185). These reports did not, however, quantify damage to Fiji reefs in terms of either its geographical extent or its effect on organisms or habitat.

METHODOLOGY: INVESTIGATING REEF CHECK AND GCRMN IN THE FIJI ISLANDS

I investigated the GCRMN and Reef Check initiatives in the Fiji Islands through a combination of interviews, discussion and observations, a process assisted when my husband assumed co-management of the Southwest Pacific node in 2001. Prior to this, I had gained considerable insight into how the GCRMN format structured ways of thinking about coral reefs, by voluntarily editing the first Solomon Islands national report largely compiled by Reuben Sulu. Furthermore, when attending the 10th International Coral Reef Symposium in 2004, I observed how various regions were encouraged to present information in a certain way, both as oral papers and as posters; I also observed first-hand how Clive Wilkinson publicised the GCRMN mission at an IUCN side event and during plenary sessions presenting GCRMN reports from various regions.

The GCRMN approach to problematising Fiji reefs

Since GCRMN seeks information from as wide a range of sites and sources as possible, and accepts data obtained using a variety of methods, university staff gather data from various agencies monitoring Fiji Island reefs. These contributors include NGOs conducting community conservation initiatives concerning reefs (such as WWF which has both a regional South Pacific and a Fiji country office in Suva), and from local consultants and resort operators.

They include Reef Check, which in the Fiji Islands operates through a local co-ordinator and a small group of contributors, a local biological consultant administering the Fiji data collation. Apart from this coordinator, those who contribute to Reef Check are associated with the tourist industry, mainly dive operators associated with tourist resorts and the Coral Cay and Greenforce scientific tourism operations. Each Reef Check contributor surveys or monitors an area using standard Reef Check methods, enters the data onto a spreadsheet, then emails this to the local coordinator who checks it and passes it onto Reef Check headquarters where scientists analyse the data by region rather than country (Ed Lovell, Biological Consultants, Suva, *pers. comm.*).

Some other international initiatives gathering data on Fijian reefs are concerned with the aquarium and coral trades, described in Chapter Twelve, and only collect data for sites at which harvesting occurs. There are, in addition, some academic researchers studying the health of Fijian reefs, including a group from the University of Newcastle upon Tyne workers, under Professor Nicholas Polunin, who in 2004 was President of the International Coral Reef Society.

The information incorporated into Fiji's GCRMN country report for any given biennial report is subsequently summarised in a South West Pacific assessment, which is sent to the GCRMN office in Townsville to be collated into a global status report (Wilkinson 2000, 2002, 2004). Officially all GCRMN data are entered into ReefBase, the database run by the World Fish Centre, an international scientific organisation (Oliver and Noordeloos 2002). In practice, the node coordinator usually keeps the raw data, only passing on synthesised reports (Reuben Sulu, IMR, USP, *pers. comm.* 2003). Some

of the GCRMN data for the Fiji Islands derives from community-oriented initiatives and some from scientifically oriented institutions without any strong link to the people of any particular *qoliqoli*.

Only two GCRMN assessment of the state of Fijian reefs have been completed, one in 1999 and one in 2004. Another national report was started in 2002 but never completed, although elements of it were included in that year's regional report (Reuben Sulu, IMR, USP, *pers. comm.*). The 1999 national report combined data and anecdotal evidence from a variety of sources, noting that most studies had been descriptive and *ad hoc* (Vuki *et al.* 1999 p. 14). It cited 41 reports on aspects of Fijian reefs and reef organisms and anthropogenic effects on those reefs (see Vuki *et al.* 1999 p. 14-16). There is no estimate of the percentage of Fijian reefs from which the data comes, although I suspect it was relatively small. Nor is the reliability of its scientific information discussed.

The authors of the 1999 status report for the Fiji Islands wrote it in the format required by regional node coordinators. It was arranged in certain categories of information: it started with a description of the country's reefs and their biodiversity, human uses, followed by a description of threats, then of conservation, monitoring initiatives and capacity, current management followed by recommendations. The emphasis was thus on identifying issues and inadequacies in current monitoring and management. This format assumes a desire to preserve reefs—to identify threats and gaps in management and monitoring and to do more to address those. In adopting the conservation ethos, it also adopts the preoccupation with preserving species, especially the larger, visible ones.

Compared to scientific reviews discussed above, the GCRMN format imposes a different sort of rigour on reports, one based more explicitly on the value of preserving coral reefs as a unique marine ecosystem. The status report format provides a snapshot of the state of reefs rather than a framework for identifying changes over time or trends. This makes it easy for the report's compilers to regurgitate existing stories, rather than conduct any fresh analysis into factors causing changes in coral reefs (*pers. obs.*). So too does the lack of any specific standards of acceptability for data, which allows the compilers to use an eclectic range of information when synthesising an overview of the state of the country's reefs. They are able to incorporate anecdotal evidence and observational material from various reports that may not have not been peer-reviewed and may not conform to general standards of scientific publishing. This gets around the problem of the scarcity of systematic surveys and monitoring studies, a problem in the Fiji Islands as in many other developing countries.

In 1999, the lack of scientific studies pushed the Fiji authors to use whatever literature was available, which in this case was mainly various anecdotal reports about overfishing—there have been few attempts to assess the status of fisheries through stock assessments, and catch per unit effort (CPUE) monitoring, the standard tools of fisheries scientists dealing with single species fisheries. There are no stock assessment data for coral, aquarium fish, or lobsters for instance, although giant clam stocks were assessed in the mid-1980s and pearl oysters in the 1990s (Richards *et al.* 1994; Kailola 1995 p. 11). The Fiji national report drew, instead, upon a general anxiety about fish being harder to catch (as reported in Fong (1994) from interviews in Bua, and in Muller *et al.* (2000 p. 180) from six Fijian sites. This anxiety is pervasive in national policy circles in the Fiji Islands. Government Fisheries' staff often

express the fear that increased monetarisation of rural Fijian society will cause overfishing as people seek to turn their marine resources into cash (*pers. obs.*).

But, in synthesising various pieces of information about reefs in the Fiji archipelago, the GCRMN reports tend to overlook how the scale of effects of fishing on reefs in a particular country or region depends upon factors such as the amount of reef area, the numbers of fish species and individuals present, the relative fishing pressure. Furthermore, they do not place their concerns within context of the biogeography and diversity of reef organisms in Fiji Islands. In this, GCRMN lacks the rigour of comprehensive scientific reports. The technical practices of the GCRMN thus differ from those of biogeographical studies.

By including the Fiji Islands in reports discussing the global state of reefs, and specifying how reefs were to be described, these data gathering exercises make Fiji's reefs part of the complex of reefs covered by crisis narrative. It does not matter that Pacific reefs are described generally as being relatively intact, they are now recognised as part of the international system that is in decline, the assumption being that it is now only a matter of time before they become as degraded as reefs in the Caribbean of Southeast Asia—unless the solutions on offer are implemented.

This is the broader argument within which the crisis narrative is operating. The crisis narrative itself, as outlined in Chapters Five and Six, is a story of decline, but one which scientists believe can be solved if people follow their recommendations. This crisis narrative is situated within a broader narrative in the form of an argument, of modernisation as the cause of environmental degradation (Chapter Two): if scientists' recommendations are not followed, then apocalypse looms for coral reefs and for the millions of people in developing countries that depend on those reefs.

Allocating Blame for Coral Reef Decline

Recreating coral reefs as global problems, these discursive mechanisms draw countries with reefs within their territories into a globalised sphere of policy concern. Other discursive mechanisms, considered in this section, specifically draw in developing countries by assigning blame for the decline in coral reefs to that category of country. These mechanisms blame either the people harvesting coral reefs organisms and/or the state for inadequately managing the environmental effects of this harvest. At the same time, they construct those groups of people as being in need of assistance, and then assign responsibility for providing this to developed countries and western institutions, in much the same manner as the capacity-building discourse discussed in Chapters Two and Three. In this section I analyse several examples, ranging from arguments about Third World population growth, the use of scientific research to construct subsistence fishing as a problem, and representations of developing countries as lacking capacity and political will.

THE CAUSE OF OVERFISHING: THE POPULATION GROWTH ARGUMENT

Many of the scientists and commentators vocal in the debate about the future of coral reefs have attributed pressures on coral reefs to increased human populations and economic activity in the tropics over the past 50 years (e.g. Wilkinson 1998 p. 6). "Unless these threats [due to human activities] are managed and mitigated, reefs will continue to degrade with the inexorable increase in human populations and pressures" (Wilkinson 2000 p. 18). ICRI's 1995 *Call to Action* suggests that population growth, along with increasing pollution and increased uses of reef resources will accelerate the decline in coral reef ecosystems (International Coral Reef Initiative 1995). In a text on reef fisheries, WorldFish Centre scientist John Munro (1996) contends that two factors largely govern coral reef fisheries, the first being population density, and hence demand for seafood; the second is distance from human centres of population (which affects fishing as well as access to markets)[2]. In the 1998 *Reefs at Risk* exercise, the authors assume that high populations were threats to coral reefs, and that large cities have larger zones of potential effect than smaller ones, irrespective of income level or sewage treatment. In the same vein, Wright (1993 p. 250) argues that there is ample, largely anecdotal evidence to suggest that reef resources close by most urban centres suffer from growth overfishing—the progressive removal of most large individuals from a population, resulting in average fish size of catches decreasing over time.

Just as the population explosions of crown-of-thorns starfish in the 1960s had prompted dire predictions of the demise of coral reefs (Chapter Five), as knowledge of the anthropogenic impacts on reefs grew throughout the 1970s and 1980s so too did fears that growing human populations in developing countries would cause such a demise. This statement in an article by a well-known coral reef scientist, published in the *Coral Reefs* journal, expresses this fear:

> The knowledge that coral reefs have survived several hundred million years through bolide impacts of meteors or comets, through partial extinctions caused by all manner of catastrophes, through 20 or so ice ages, may prove that coral reefs are robust ecosystems. But that proof may hold little consolation to a world undergoing a human population explosion.... for either of us to survive, mankind must discover a way to control human population growth (Grigg 1992 p. 183).

Although the scientific literature about the effects of fishing on reefs, described earlier, and this expert argument about its causes, are often found in the same articles they do not intersect analytically. One is based on scientific marine research on coral reefs; the other is based upon observations and theories about human society. Although much of this argument about population growth as the cause of overfishing is presented as being scientific in nature and scientifically-based, it is also a policy argument with a political basis.

This fear of population increase in developing countries has Malthusian overtones. Indeed, the term Malthusian overfishing has entered the terminology of fisheries management (e.g. Pauly 1994; Roberts

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[1] If an area is very remote it may subject to a different type of fishing: distant-water fishing vessels target particularly valuable species such as lobsters, giant clams, groupers and snappers on remote, sparsely populated atolls in the Pacific (Munro 1996 p. 8).

1995; M^{c}Manus 1997). One of several types of overfishing described in fisheries management literature, the term was originally introduced by fisheries scientist Daniel Pauly (see Pauly 1988; Pauly *et al.* 1989). It hypothesises a situation where poor fishermen, faced with declining catches and lacking any other alternative, initiate wholesale resource destruction in an effort to maintain their incomes (M^{c}Manus 1997 p. S127). Pauly introduced this concept to describe how, in tropical developing countries when small-scale fishers, poor and lacking alternative employment opportunities start fishing, they are forced to continue. Over time the number of fishers increases, natural reproduction rates being exacerbated by the numbers of landless farmers turn to fishing. Faced with declining catches, fishers are forced to induce wholesale resource destruction in their effort to maintain their incomes (Pauly 1994 p. 10). Pauly (1994 p. 12) suggested that, over the long-term of this scenario, total production would fluctuate and eventually gradually decline as fishing effort increases and biodiversity is reduced.

Pauly drew his examples from Asia (India and the Philippines). He intended this concept of Malthusian overfishing to describe a small-scale fishery with a large adjacent sector, generally agriculture, generating surplus labour which the fisheries resource system cannot absorb without damage (Pauly 1994 p. 8). The term has, however, been used in a more general sense to describe situations with stagnating overall catches, decreasing catch and income-per-fisher, use of destructive fishing techniques and a breakdown of traditional management systems, or merely with rapidly increasing populations and heavy reef fishing pressures (e.g. Roberts 1995 p. 989).

> Coastal resources have increasingly been exploited beyond their sustainable limits as populations in the region have skyrocketed. Much of this growth is occurring among people living at subsistence levels. For example, small-scale operations contribute about 95 percent of total marine fisheries production in Indonesia... Coral reefs are capable of supporting low levels of fishing sustainably, especially when the fishing is done with nondestructive gear and effort is spread among several species of carnivorous fishes. Fishing effort on any given species should not cause it to decline or make it vulnerable to natural fluctuations in survival rate. However, widespread poverty and the generally open-access nature of coral reef fisheries in the region can cause people to enter or remain in reef fisheries until the average fisher makes no net profit owing to high effort and low catch. If stock levels are low enough, fishers may shift from high-valued fish to less valuable species (Chapter 4 in Bryant *et al.* 1998).

The belief that population growth is a cause of overfishing is remarkably similar to the views of Paul Ehrlich and E O Wilson (1991), who maintained that in "poor nations", any more or less pristine ecosystems ('virgin areas') could only be saved if "birth-rates can be dramatically lowered" (a point made by Flitner and Heins 2002 p. 330). While this perspective at first appears to be a distinctly neo-Malthusian view of modernisation, it is not, however, expressed in the Malthusian terms of population growth threatening political stability. It may, instead, simply be reviving a longstanding debate about the population-conservation nexus that is infused with the colonial and postcolonial legacy of discriminatory land policies and coercive conservation (cf. Flitner and Heins 2002 p. 331). The metaphor of 'spaceship earth' describes this scenario well. This is a special kind of metaphor, a variation on that depicting nature as a machine found in cybernetic ecology (Chapter Two); a spaceship's problems are of a mechanical kind and can only survive if controlled by technocrats; moreover, a spaceship's carrying capacity is strictly limited (Mühlhäusler 2003 p. 135). Spaceship

earth is also a metaphor for the need for experts to be in charge, here the experts being coral reef scientists and western-educated fisheries managers.

Commentators postulating increased population as a cause of reef degradation differ in whether they believe it is economic growth, or a lack of it, that is exacerbating the degradation. Some commentators have linked the decline in coral reef health to poverty (e.g. McClanahan 2002 p. 476). M^{c}Manus (1997) suggested that poverty is destroying Southeast Asian reefs. Others blame economic growth, particularly the globalisation of the economy, for the degradation eg Wilkinson (1999 p. 867). In each case, there is, implicit in the narrative, the same assumption that coral reef degradation that has happened in Southeast Asia will eventually happen in other areas, described earlier. Here, again, is the fear of the inevitable march of modernisation throughout the developing world. The fear of increasing populations in tropical, developing countries is the same fear that propelled the development of modern fisheries management—a fear that the race to fish will destroy every last fish in the sea (described in Holm 1996 and discussed earlier, in Chapter Two). In coral reef fisheries the villain is not industrial capitalism but the peasant fisher in Asia, the Pacific Islands, and other developing regions.

An extensive World Bank study of Pacific Island coastal communities demonstrated that this is not a universal perception. Titled *Voices from the Village*, this study was conducted in 31 communities in five countries including the Fiji Islands, in 1998-99. Quantitative data analysis showed that perceptions of success in coastal resource management were not necessarily influenced by population growth rates; to the contrary, several sites where resource trends were perceived to be worsening were relatively isolated and had low populations (Muller *et al.* 2000 p. 179, 180). The analysts obviously found this result troublesome despite its apparent statistical robustness, trying to explain it away as "capturing other site characteristics" such as the level of technology used in fishing (Muller *et al.* 2000 p. 179).

THE CONSTRUCTION OF SUBSISTENCE FISHING AS A PROBLEM

In stories about the decline of coral reefs, commercial fishing is usually blamed for reef degradation. Here, I present a short study of how subsistence fisheries were recently constructed as problematic. The story concerns reefs in the Lau Islands, a remote eastern part of the Fiji Islands, where small groups of indigenous Fijians live in small villages on small islands, in a close relationship with coral reefs (as described in the next chapter). Across the world, in a British university, researchers brought these villagers to international attention by attributing to them, a decline in the health of their reefs caused by their fishing for subsistence. They did this by releasing a press statement at that same time as their research findings were published in the scientific journal *Ecology Letters* (May 2004). The press statement, which quoted Professor Nick Polunin, the research leader and one of the paper's authors, was widely reported in the British news media. It highlighted their findings in a controversial way, which differed from the more measured tones of the scientific paper.

This research is the latest in a series of studies by University of Newcastle upon Tyne researchers, which Polunin, as President of the International Coral Reef Society as well as research leader, described in his keynote presentation in Okinawa at the 2004 ICRS. The research was conducted in the Lau Islands because these have no industrial development or non-domestic sources of pollution within

150 kilometres radius; Lauan villagers practise subsistence agriculture is a manner considered unlikely to significantly affect the state of reefs (Dulvy *et al.* 2004). By selecting these sites, researchers were endeavouring to minimise any effect on reefs attributable to any cause other than subsistence fishing.

METHODOLOGY: TRACING THE PROBLEMATISATION OF SUBSISTENCE FISHING

When searching for scientific papers on coral reef research on the Fiji Islands, one of the lines I took was to find the publications resulting from the series of studies undertaken by researchers and students from the University of Newcastle upon Tyne, spurred partly by hearing Polunin's keynote address at the 10th International Coral Reef Symposium which focused on his groups' Fiji research. Using Google to locate these in May 2004 (using Polunin's name as a keyword along with Fiji and coral reefs), I came across several media articles about the damage that traditional fishing was supposedly causing coral reefs, quoting Polunin. From this I was able to locate the press release that spawned these, as well as the citation for the scientific paper reporting the research discussed in the press release. Obtaining the paper, I was then able to analyse the different constructions of cause and effect (amongst fishing intensities, removal of predatory fish, outbreaks of crown of thorns starfish, and phase shifts in coral reef communities) used in the scientific publication, the press release, and the subsequent media reports.

The way that subsistence fishing is implicated in the degradation of coral reefs differs between the scientific paper, the press release, and the subsequent media reports. The paper in *Ecology Letters*, titled *Coral reef cascades and the indirect effects of predator removal by exploitation,* examined ecosystem-scale biodiversity consequences of predator removal, documenting predatory reef fish densities, coral-eating starfish densities and coral reef structure along a 13-island gradient of subsistence exploitation (Dulvy *et al.* 2004 p. 410). In drawing conclusions about the effects of subsistence fishing, the authors wrote.

> Our data suggest that predator removal by subsistence exploitation may be sufficient to allow outbreaks of the crown-of-thorns starfish indirectly resulting in cascading changes in ecosystem structure and function. The higher densities of the coral-feeding starfish associated with subsistence fisheries exportation have resulted in repeated shifts [*number not specified*] in benthic community structure from that dominated by carbonate accreting reef-building organisms to domination by non-reef-building organisms (Dulvy *et al.* 2004 p. 413-414).

The authors then caution that they concluded this by using correlation. Since in ecology, causality can only be determined through experimental manipulation, this raises some doubts about their conclusions. The authors also noted that they observed crown-of thorns starfish at only six of the 13 islands in the study, adding that, on some of the other seven islands, the intensity of fishing estimated

and the density of predatory fish measured, overlapped with islands where the starfish outbreaks occurred (Dulvy *et al.* 2004 p. 414). These cautionary statements, included in the scientific paper, are not repeated in Polunin's press release. In that, Polunin confidently wrote:

> Scientists previously thought that diverse ecosystems such as coral reefs would be resilient to the impacts of predator removal ... this study suggests that even low levels of fishing may cause ecosystem meltdown... We were very surprised our research showed such light levels of exploitation by subsistence islanders fishing for food could cause such profound ecosystem changes (Polunin 2004).

The subsequent media reports (e.g. Reaney 2004; Tighe 2004) go even further, highlighting this as a case of traditional fishing damaging reefs. One article in the Guardian-UK (Wainwright 2004) headlined subsistence fishers "wreaking havoc on reefs in Fiji". There is no doubt or caution in these media accounts. In the online *Financial Times* Tighe (2004) wrote "Their findings... conflict with the previous assumptions that commercial fishing, not subsistence fishing, poses the greatest risk to the reefs, which are found in more than 100 countries and cover almost 300,000 square kilometres".

Interestingly there is a different version of the paper's abstract on the web site of the Centre for Environment, Fisheries and Aquaculture Research (part of the UK Government's Department for Environment, Food and Rural Affairs). Unlike the abstract in *Ecology Letters*, this database reference presents the work not as a study focusing on the consequences of predator removal on coral reef ecosystems but as one examining the effects of subsistence fishing on coral reefs—something which suggests that, in conducting the study, the researchers had an interest in demonstrating whether and how subsistence fishing affects coral reefs in the Fiji Islands. This abstract states that:

> We show that coral reef phase shifts may result from subsistence levels of exploitation. Ecosystem state was measured along an island-scale gradient of fishing pressure in Fiji. The density of a keystone coral-feeding starfish (*Acanthaster planci*) [crown-of-thorns starfish] increased along the fishing gradient resulting in large-scale mortality of reef-building corals and subsequent phase shifts. Predatory fish density declined in response to exploitation suggesting the starfish, checked by a predator-controlled Allee effect at the most lightly fished islands, is released from predatory control even by subsistence levels of exploitation[3]. A simple predator-prey model shows how exploitation can reduce coral-reef ecosystem resilience (Dulvy *et al.* 2004).

They had chosen the Lau Islands for their research because they regarded them as "relatively pristine" ecosystems, disturbed only by subsistence fishing. They thus set up subsistence fishers as the likely causes of any degradation observed, even before commencing the field research.

As well as having an interest in demonstrating whether and how subsistence fishing affects Lau coral reefs, the researchers appear, from their paper's conclusions, to believe that subsistence fishing damages coral reefs even though their scientific evidence is weak. These weaknesses are worth pointing out. First, the study was based upon an index of fishing intensity previously calculated, which

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[2] Allee's principle recognises an intermediate optimal population density, in which groups of organisms often flourish best if neither too few or too many individuals are present (*M^cGraw-Hill Dictionary of Scientific Technical Terms*, 6th ed.).

needed further verification of its accuracy as it was a key part of the correlation. Second, surveys were small in number and temporal replication and they were not designed to follow coral recovery after a crown-of thorns outbreak—the authors merely assumed that a phase shift was occurring because there were three features of the data consistent with thresholds and phase shifts (see Dulvy *et al.* 2004 p. 414-415). These weaknesses should have been apparent to the researchers. Third, the paper made no mention of the live reef food fish trade which had been operating sporadically in Lau, in the years before the study (according to Peter Sands, industry representative at a workshop on the live reef food fish trade, Suva, 2001). This could have confounded the researchers' conclusions at one site at least. Furthermore, in examining the effects of removing predators from coral reef ecosystems—how predator removal influences ecosystem structure and function—the researchers assumed that all removals of predators occurred through subsistence fishing, yet made no attempt to verify this, beyond casual observations that the communities appeared to be consistent with this observation (Dulvy, *pers. comm.*).

Polunin appeared keen to publicise this 'finding' that subsistence fishing was degrading reefs, thus enrolling the Lau Islands in the global coral reef crisis. The researchers also do this in the final paragraph of their *Ecology Letters* paper, writing: "These findings provide an additional challenge [the impacts of fishing predatory fish] for biodiversity protection and coral reef management strategies", suggesting that the maintenance of a minimum level of predators across reefs would be a useful management approach, and recommending marine protected areas for protecting reefs from pest outbreaks (Dulvy *et al.* 2004 p. 415).

BLAMING A LACK OF CAPACITY AND POLITICAL WILL

In texts about coral reefs, found in the international sphere of policy, there are some very common rhetorical devices that blame the coral reef crisis on a lack of capacity in developing countries and a lack of political amongst their politicians. In their policy statements, both ICRI and the USCRFT depict developing countries, where most reefs are situated, as needing capacity building, as shown in the text cited in Tables 12 and 16 in the previous chapter for example. These two bodies blame developing countries for the worldwide decline. So too does the GCRMN, in its global status reports, the summary chapters of which function as informal policy statements. The 2004 GCRMN report notes, under "Poor capacity for management and lack of resources" that "most coral reef countries lack trained personnel for coral reef management, raising awareness, enforcement and monitoring; also a lack of adequate funding and logistic resources to implement effective conservation" (Wilkinson 2004 p. 19). The reports suggests:

1. assisting in the training of environmental resource managers and ensuring that they are provided with in-country employment;
2. assisting countries in the development of alternative livelihoods to combat poverty and reduce the need to over-exploit coral reef resources;
3. assisting developing countries design, implement and manage networks of marine protected areas to conserve their resources;

4. consolidating the training provided by UN agencies and MEAs to ensure that they are targeted on resources, issues and problems relevant to conserving national resources;
5. providing adequate and long-term financial and logistic resources for developing countries to undertake environmental planning for the longer-term, rather than the three to five year funding cycle of projects;
6. assisting in the recognition of appropriate traditional knowledge and methods of environmental management and help governments harmonise these with state and national laws;
7. developing the "capacity to build capacity", and using "train-the-trainers" and peer-to-peer exchanges as low cost mechanisms to ensure that capacity building is as a self-sustaining mechanism (Wilkinson 2004 p. 39).

In the section of the US coral reef plan dealing with international trade, there is another such example of the way blame is generally assigned to developing countries rather than developed ones. Although the USCRTF does acknowledge the need to ensure that US consumer demand for marine aquarium organisms does not threaten the sustainability of coral reef species and ecosystems, it largely allocates the fault for the coral reef crisis not to consumers but to exporters. Of the seven actions in the national coral reef plan recommended to reduce the impact of international trade, six concern the countries of origin, and only one concerns the demand created by US consumers; unlike the previous six recommendations, the latter recommendation is not explicit about the measures to be taken, merely recommending calling for "additional measures as appropriate to ensure that US consumer demand for marine aquarium organisms does not threaten the sustainability of coral reef species and ecosystems" (United States Coral Reef Task Force 2000). In this way, the plan skirts around the part played in by American lifestyles that feed the desire for pretty corals and reef fish in domestic aquaria. It, instead, frames the issue in terms of the sustainability of the trade and lays the largest portion of the blame on exporting countries that fail to enact and enforce adequate legislation to control exports at a sustainable level, and on international regulatory agencies (i.e. CITES) for failing to ensure this. In doing so, it positions developing countries as needing capacity-building.

A lack of state capacity in fisheries management

In the literature claiming overpopulation as the cause of overfishing, several explanations are proffered for insufficient or inadequate attention being paid to the state of these fisheries. One specified reason postulates a chronic shortage of human and other resources in developing countries—the lack of capacity argument. More specifically, a lack of expertise in managing coral reef fisheries is given as a reason. This argument takes two forms. First, there is the suggestion of a widespread failure among professionals to realise that most tropical coastal fisheries are fundamentally different from the capital-intensive, large-scale, commercial/industrial fisheries of northern seas. Second, managers are accused of basing their actions on ecological principles for which there may be scant scientific justification, particularly in the case of complex tropical communities (Pauly 1995; Munro 1996 p. 8-12; Sale 2002 [1991] p. 361). These explanations portray state fisheries management agencies as incapable of adequately managing coral reef fisheries, resulting in degraded coral reefs. Similar criticism can be found in literature about fishing in the Pacific Islands. For example, this quotation, from a recent

review of the region's coastal fisheries, commissioned for the GEF-financed International Water Programme, depicts these small island developing states as lacking in capacity, and the fisheries managers within it as incompetent:

> In the face of mounting foreign debts and budget deficits, most island governments simply lack the fiscal and administrative resources to effectively implement and enforce legislation aimed at environmental protection and resource management. Central authority is weak and limited in scope in some Pacific island countries, particularly in areas remote from the seat of government. The fishery regulations implemented by bureaucrats residing in urban administrative centres are often based on an incomplete understanding of the ecological and social realities in outlying communities. Such regulations tend to lack legitimacy in the eyes of the residents of those communities and they are evaded at every opportunity. Typically, government-management consists of a proliferation of regulations that government fisheries departments do not have the resources to enforce. In short, governments in the region may be empowered to exercise some degree of jurisdiction over coastal fisheries, but in reality their effective control is often negligible...At best the majority of governments have resorted to crisis management, usually in response to the boom and bust cycle of a coastal fishery producing an export commodity (Dalzell and Schug 2002 p. 10)[4].

This is one example of a suite of similar critiques of state fisheries management in developing countries. Those critiques implicate, in the declining state of coral reefs, the governance systems used in tropical developing countries to manage coral reef fisheries. Lamenting the demise of traditional community-based management systems that once protected the resource, they criticise modern state-run management of coastal fisheries in these countries as being inadequate, often poorly implemented. It is uncommon for these texts to analyse the merits of the management that is taking place; instead stories make general claims that insufficient or inadequate attention is being paid to the state of coral reef fisheries in various developing countries.

In characterising state fisheries management agencies in developing countries as needing assistance to deal with the environmental problems facing their reefs, this criticism enrols them into contemporary international efforts to manage coral reefs as a global problem. It gains added credence when combined with arguments constructing reefs as a global problem, and narratives about the causes of coral reef degradation worldwide.

Poor governance and a lack of political will

Another criticism thrown at developing countries is that they lack the political will to address problems. In the Executive Summary to the *Status of the Coral Reefs of the World: 2004*, Wilkinson wrote:

> Many coral reef countries lack the resources of trained personnel, equipment and finances to effectively conserve coral reefs... this... is often exacerbated by a poor awareness of the problems facing coral reefs and their significance in local economies, and inadequate political will to tackle difficult environmental problems (Wilkinson 2004 p. 8).

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[3] I have omitted the five citations used in the original text, since these citations are not the only instances of such statements and cannot be relied upon as being the original sources of such ideas.

This is a classic statement of the lack of capacity argument (inadequate trained personnel, equipment and finances), extended to implicate the governments as incapable of recognising that coral reefs are a major problem they should be tackling. The expression 'lack of political will' conjures the idea of lazy, perhaps corrupt politicians, not doing their job adequately. Adding the phrase "to tackle difficult environmental problems" suggests those politicians have deliberately turned a blind eye to the problems facing reefs, rather than that they have decided to allocate limited resources to issues they considered more pressing. Later in the same executive summary, Wilkinson attributes the problems facing coral reefs to increasing population pressures in tropical countries:

> There are many explanations for the poor governance and low political will to conserve coral reefs. Most tropical countries have rapidly increasing coastal populations, consequent rising levels of poverty, which put increasing pressures on coral reefs to provide food and other resources; usually beyond sustainable limits. These pressures have caused, and will cause, collapses of coral reefs and phase shifts towards algal dominated reefs at the expense of corals (Wilkinson 2004 p. 31).

Of many possible explanations for poor governance and low political will, Wilkinson offers only one, increasing human populations. His argument is highly generalised. Not only does it implicate most tropical countries, it implicates all layers and types of governance found within those countries, from the national government through local government and any form of community or household governance. It also stretches scientific reasoning; no formal link has been established between rapidly increasing populations and the phase shifts seen in the Caribbean over the last quarter century.

The possibility of future degradation as a justification for expert intervention

Wilkinson allocates the responsibility for fixing the problems facing coral reefs in tropical countries and for rectifying poor governance, to the international agencies, national donors and NGOs currently assisting those countries to protect and better manage coral reefs. He suggests how they could be more effective in providing that assistance. He thus uses an argument about the causes of phase shifts on coral reefs to justify those organisations intervening in developing countries in the name of saving coral reefs. This is the same argument used by that those advocating management strategies for reef resilience on a regional basis (e.g. Nyström *et al.* 2000; Bellwood *et al.* 2004).

There has been a temptation to attribute human causes to coral bleaching and to use this to further justify certain policy interventions in developing countries, as in World Bank research project into coral bleaching and NGO projects that link marine protected areas and resilience to bleaching. There is an ongoing debate about whether coral bleaching is a cause or a symptom of coral reef decline and whether it is a sign of global warming causes by increased greenhouse gases. Do recent patterns (e.g. increases in sea surface temperatures) reflect the natural variability of the system or the effects of greenhouse gas-induced warming? A recent contributor to Coral-List (researcher and engineer John Ware, 8 June 2004) pointed out that no work has attempted to determine a direct link between putative warming and coral bleaching and reef degradation. Nevertheless, in much contemporary coral reef literature, coral bleaching is widely regarded as a manifestation of global warming. Since many believe global warming is due to enhanced greenhouse gas production by human population on Earth, coral bleaching is widely seen as another result of this. This, as Ware pointed out, is a leap of faith rather

than a leap of science. Yet it, too has been used as a justification for intervention—assuming that ways can be found to encourage reef resilience in the face of both coral bleaching and the various damaging activities listed in Table 7.

Discussion

POLICY AT THE INTERFACE OF SCIENTIFIC EXPERTISE AND POLITICS

Universal problematisation of reefs

Coral reefs are being discursively created as a single universal problem through multiple mechanisms: through GCRMN, scientific reviews, policy reports, even the construction of single research programmes. Along with the process of disseminating the crisis narrative described in Chapter Six and the process of preparing global status reports described in this chapter, these discursive mechanisms recreate coral reefs as a series of problems that can be addressed through planned and co-ordinated responses, and through efforts to encourage the resilience of reefs in the face of climate change and anthropogenic impacts. These devices portray coral reefs as a problem to be rescued and managed lest they become extinct and their environmental services and economic benefits are lost to humans. This universal problematisation is one of the characteristics of the global environmental policy discourse reflected in common metaphors and storylines and arguments about coral reefs.

Both the fishers and those trying to manage fisheries in developing countries (whether state or traditional) are being blamed for a global decline in coral reef health. Not only coral reefs are imagined as a problem, so too are increasing populations in tropical countries, reflecting Western fear of destabilisation (Chapter Two).

Capacity-building as a political response

As well as reinforcing the legitimacy of those intervening in developing regions to save their environment, the capacity-building storyline engenders the cooperation of people and institutions of developing countries, by positioning them as in need of help. Through discursive devices, developing countries have been recreated as sites for expert intervention by coral reef scientists, managers and other environmental specialists representing the organisations constituting the ICRI network and associated NGOs. Through repeated use of such stories and arguments, a case for global coral reef management (or regional management combined under a global strategy as advocated by Nyström *et al.*2000 and Bellwood *et al.* 2004) is being built discursively. This reflects modernity's faith in humankind's capacity for planning and control, and in international cooperation as an appropriate and effective way of addressing global environmental problems.

The solution is considered to lie in the funds, technical expertise and organising ability of industrialised states (North American, European, Australasian or Japanese) and their agents, both intergovernmental and nongovernmental. This reflects faith in the superiority of the Western-trained expert, characteristic of the global environmental policy discourse—the implicit belief in the superiority of western skills knowledge, western achievements, and western institutions which underlies modernisation theory and the post-war project of development.

Underrating the complexity of human social systems

In refocusing strategies to save coral reefs on encouraging reef resilience, experts are trying to maintain a sense of control and of hope in a world which new ecological ideas are portraying as complex, even chaotic. An explosion of interest in the 1970s in mathematical ecology and the instability properties of both model and real systems has produced new ecological concepts of nonequilibrium, focusing on the nonlinear nature of systems especially those with high levels of temporal and spatial variability (Scoones 1999 p. 482). These new concepts include the idea of ecosystems having multiple rather than single stable states; the recognition of chaotic dynamics where nonlinear interactions have sensitivity to initial conditions and lack long-term predictability; and stochastically-dominated systems without any simple regulatory feedback mechanism (ibid). This explosion of interest in nonequilibrium ideas has produced not just a new wave of empirical inquiry but also a wave of theorising over the implications of nonequilibrium dynamic change. The idea of a world of natural chaos belies belief in an infinitely wise plan in which everything functions with perfect harmony (Worster 1993 p. 169). The concept of adaptive management attempts to maintain a sense of control in this world of natural chaos, also a sense of hope that we can somehow manage to avoid what would be catastrophic for human life and can retain a sense of what natural, healthy, beautiful ecosystems are.

Although there has been a trend over the last few decades for coral reef scientists to recognise the increasing complexity of the biophysical world of coral reefs (e.g. Knowlton 1992; Hughes 1994; Done 1999), this trend has not translated to recognition of the complex nature of the social world of those people who use and govern reefs. Rather, insights from complexity theory and the 'new ecology' have been confined to the non-human components of coral reef ecosystems. Arguments that attribute 'failures' to utilise data on the state of reefs as being due to a lack of political will and capacity are positivist. They espouse a simplistic cause and effect relationship in a complex world. In relying on arguments about lack of capacity and political will, these texts proffer a caricature of people in countries like the Fiji Islands. Furthermore, in concentrating on the supposed failings of only one side of the developed/ developing country dichotomy, the explanation of coral reef degradation is biased. Even the concept of adaptive management (mentioned earlier) is designed to address the complexity of natural systems rather than human ones.

A HEGEMONIC VIEW OF THE WORLD

Professional experts working on coral reef policy that impinges on the Fiji Islands and other developing countries may or may not intend to exert western domination over those countries. But this is certainly the overall effect of the various common narratives, metaphors and arguments about coral reefs encountered in scientific papers and texts, policy papers and other expert-produced documents. Through data-gathering projects, the GCRMN global status reports, and through scientific papers such as Dulvy *et al.*'s *Coral reef cascades and the indirect effects of predator removal by exploitation*, sites such as the Fiji Islands are deliberately being re-imagined as sites of degraded coral reefs. The archipelago (and other locations around the world) are deliberately being drawn into universalised stories and arguments about the extent of degradation and its causes, and into normative espousals of what needs to be done to redress this. This is occurring without extensive data on the state of Fijian

reefs. Embedded in these expert-produced texts about coral reefs, there is a relationship of western domination over Third World societies, the same expression of Western superiority found in modernisation theory. Although these texts do not actually constitute domination, they facilitate it, being "intimately rooted in discourses of presumed superiority, mission, and negative essentialisations of the Other" (Slater 1999, quoted in Chapter Three). These texts, through their pervasive and persistent positioning, set the scene for domination of developing countries. They do so, in part, by claiming to provide the 'one true reality' about coral reefs in developing countries rather than a perspective built on particular epistemological and ideological preconceptions (to borrow a point which Fry (1997) made about contemporary Australian representations of the South Pacific).

Repetition of standard storylines is akin to the repetition of commonsense, a view so thoroughly diffused that it has been internalised as commonsense. These standard storylines act as hegemonic commonsense, institutionalised through expert but everyday practices of those involved in science/policy. Repeating these standard storylines, experts create situations for expert intervention and international cooperation on environmental matters.

How experts contribute to this hegemonic view through habitus

Yet, even though scientists and others in the coral reef science community repeat the metaphors and storylines standard to these texts, most appear to have no strategic desire to dominate those in developing countries. Rather they act through habitus (explained in Chapter Four). A storyline of a crisis requiring expert intervention forms the habitus of individuals and organizations that operate in the transnational environmental policy field.

Wilkinson serves as an example of how individuals and organisations in the field of international environmental policy vacuum up various metaphors and storylines, and put these to use in justifying themselves, their activities and their claims for resources and support. In his everyday work, Wilkinson reproduces the properties of the field in which he works. As a creative human agent immersed in the field of international environmental policy through his work as global coordinator of the GCRMN, a position he has held since its inception in 1995, Wilkinson is able to employ his knowledge and skills to maintain and advance his position in that field (cf. Swingewood 2000 p. 215 quoting Bourdieu and Wacquant). His social location as the holder of a professional position in national (AIMS) and international (GCRMN) organisations funded to solve coral reef problems, and his social status as an international expert in coral reefs, would predispose him towards certain arguments and storylines that support the expert nature of the process of saving coral reefs. The liberal, institutionalist politics of cooperative security which dominate many countries with which he deals—Australia as his place of employment, the US as funder, various European countries as the base for key multilateral agencies with which he negotiates—would predispose him to believing that global environmental problems must be managed through trust and cooperation amongst states, intergovernmental and nongovernmental agencies.

Patterning texts as a way of generating consensus and maintaining order

There is another equally insightful explanation to be found in the patterning of documents (described in Chapter Three), as a way of maintaining legitimacy and generating consensus. In Riles' study of Fiji Islanders preparing national and regional documents to take to international conferences on women, she described how, when the aesthetic of design, the pattern of the text being produced becomes important, then orthodox discourse can be reproduced without analytical or political engagement (Chapter Three). She recounted how a Fiji Islands delegate had explained to her that their Pacific platform "solidified" through the process of transposing language from one document to another through quotation (cutting and pasting) (Riles 2000 p. 89). From her study, Riles concluded that international law and politics, in the mode of information, represent not so much a revolution of norms as a perfection of terms in which form generates consensus where content and doctrine could never do so (Riles 2000 p. 182). "Both perfectly complete and utterly vacuous, forms such as facts and matrices, brackets full of text, or numbers and networks enable viewers to share everything and nothing, as does, for example, 'knowing the facts'" (Riles 2000 p. 184). A similar preoccupation with the form of texts, with consolidating consensus through quotation, cutting and pasting—a similar disengagement from the analytical—is shaping coral reef policy texts such as the GRCMN global status reports, thus contributing to the reproduction of orthodox discourse.

Experts may reproduce patterns in texts as away of furthering consensus. Kanak leader Jean-Marie Tjibaou is reported to have explained that "the Kanak discourse is not a thesis, antithesis, synthesis. It consists of repeating to convince" (Waddell 1984 p. 82). In Melanesian culture, repetition may serve the purpose that logic serves in Eurocentric culture. Furthermore, patterns in texts repeated over time can have the comforting appearance of legitimacy. Repetition in texts also creates a certain order, a sense of certainty. The regional action plans, which the SPREP secretariat has produced every four years, follow the same model, some new parts added each year but certain themes, chunks of text, and policies repeated each time. Thus each new document looks similar to that approved previously, generating for its authors the confidence that it, too, will be acceptable to the governing council of Pacific environment ministers who set the organisation's strategy and budget. Repetition in texts creates a certain order, a sense of certainty. Yet, even as the reproduction of discourse pursues a pleasing pattern and generates consensus, this patterning has the potential to reproduce a relation of domination, as I explore further in later chapters (Chapter Thirteen pulls these insights together).

Conclusion

Whether, in this analysis of hegemony, experts act through habitus, commanding expert discourses and repeating them to demonstrate their command of policy prescriptions suitable for addressing the coral reef crisis, or whether they repeat standard arguments as a way of plaiting weak ties, helping to generate consensus and maintain order, matters not. In either case they are constructing the survival of coral reefs as dependent on expert intervention—on the intervention of those forming an assembly around the notion of a coral reef crisis. Moreover, they are reinforcing the relationship of First World–

Third World domination embedded in those expert discourses, even when this is not a deliberate intention.

At this point I move from the international sphere of policy to that connecting with the Fiji Islands. The standard narratives, storylines, metaphors and practices of international coral reef policy, described in the previous chapters, are not the only storylines about coral reefs to be found in Suva. To study the connections between the international sphere of policy and the Fiji Islands, requires some awareness of those other storylines, and how they intersect—as the next chapter discusses.

Part III

Interrogating the Local

MAP 3: CORAL REEFS OF THE FIJI ISLANDS

Source: Spalding *et al.* (2001)

FR = forest reserve; NR = nature reserve; WS = wildlife sanctuary


Vanua Levu Group
Great Sea Reef
Kia
Ovatoa Reef
Round Island Passage
Naivaka
Vanua Levu
Yasawa Group
Yasawa
Yadua Taba Island Crested Iguana Reserve WS
Ethel Reef
Nacula
Thakau Levu Reef
Vanua Levu Group
Namenalala Island NR
Bligh Water
Naviti
Namena Barrier Reef
Viwa
Fiji Platform
Vanua Levu Barrier Reef
Yatu Ira Channel
Waya
Koro
Mamanuca Group
Lomaiviti Group
FIJI
Ovalau
Viti Levu
Nairai
KORO SEA
Malolo Barrier Reef
Navula Reef
Vuo Island NR
Draunibota and Labiko Islands NR
SUVA
J. H. Garrick Memorial FR NR
Suva Barrier Reef
Viti Levu Group
Gau
Coral Coast
Mabulica Reef
Beqa
Beqa Barrier Reef
Vatulele
North Astrolabe Reef
Moala
Kaduvu Passage
Kadavu
Ono
Great Astrolabe Reef
Moala Group
Matuku
Kaduvu Group
PACIFIC OCEAN
Thikombia I.
Cakau Vucovuco
Cakau Matacucu
Vetauua
Qelelevu
Nukusemanu Reefs
Ringgold Isles
Heemskercq Reefs
PACIFIC OCEAN
Budd Reef
Rabi
Nanuku Reef
Wailangilala
Qamea
Namuku Channel
Duff Reef
Taveuni
Ravilevu NR
Exploring Isles
Yacata
Kanacea
Vanua Balavu
Malevuvu Reef
Vatu Vara
Mago
Katafaga
Lau Group
Tuvutha
Thakau Tambu
Cicia
Thakau Lasemarawa
Lakemba Passage
Nayau
Reid Reef
Bukatatanoa Reefs
Lakeba
Aiwa
Vanua Vatu
Oneata
Lau Group
Oneata Passage
Moce
Thakau Vau
Navatu Reef
Tavunasici
Namuka Llau
Vuanggava
Thakau Levu
Kambara
Navutu Lloma
Totoya
Fulanga
Ogea
Ongea Ndritu
Nukusonge Reef
Vatoa
Vuata Vatoa
N
0 30 60 90 120 150 km
176°54' 177°00' 177°6'
12°30'
12°36'
Hatana
Uea
Hofliua
Rotuma
0 4 8 12 km
174°35' 174°40'
21°45'
21°50'
Conway Reef (Ceva-i-Ra)
0 3 6 9 km
179°00' 178°50' 178°40'
20°40'
20°50'
21°00'
Oni-i-Lau
Vuata Ono
0 8 16 24 km
Tuvana-i-Ra
Tuvana-i-Colo
176° 177° 178° 179° 180°
16° 17° 18° 19°

Chapter Nine

Coral Reefs in the Fiji Islands: a 'Local' Perspective

Introduction

Having described the international sphere of coral reef policy, this chapter moves to the local, specifically the Fiji archipelago. There, the narratives, arguments and metaphors about coral reefs that Wilkinson and others reproduce in policy documents, in scientific texts, and media articles are not simply accepted and reproduced. Rather they meet other storylines and discourses, including some about Fijians' special relationship with reefs and indigenous rights. Here, I begin to explore how the intersection of various discourses shapes local policy.

Chapter Eight depicted Fiji reefs in a certain way, part of the declining state of coral reefs worldwide, although maybe further from crisis than in many countries. In various texts to be found at USP however, there is an alternative, much more optimistic view of coral reefs as part of *vanua* in which Fijians are bonded to land and sea, intimately bound into the lives of Fijians; these texts tell of how the state is helping Fijian communities to address localised overfishing. This alternative view reworks traditional accounts into the design of academic reports and adds descriptions of modern fisheries management techniques. So this alternative view is itself the product of international-local connections and intersecting discourses.

In the first part of this chapter, I present this view, summarising published material and government reports. The final section examines the content of government policy on coral reefs up until the time when GCRMN node in Suva became active in 1999. This highlights some of the discourses influencing those government policies.

A Discourse of Academic and Policy Circles

This is not an anthropological study of the role that reefs play in the lives of Fiji Islanders. What I have written in this chapter, about how Fiji Islanders use reefs and how reefs are important to them, is a summary of what one can find in publications and unpublished reports. This is the sort of account that any policy analyst wanting to know about the use of coral reefs in Fiji could establish through a good literature search, especially with access to USP's library catalogue, since the majority of source materials are produced in the Fiji Islands and many are catalogued in that library. In sum, this is the knowledge that can be found by reading. So, in this sense, this is an account biased according to the type of knowledge that is being published or being produced in consultancy reports. These accounts present themselves as being as politically neutral. Although each has been written to answer particular kinds of questions set by the circumstances or commissioning agencies, none describe the political ideology or agendas of either the author(s) or commissioning agents.

This is the knowledge available to outside observers: the academic commentators, the environmental advocates and the political decision-makers. We—I include myself in that category—know Fiji's reefs through accounts of their use, mainly in fishing, of their role in Fijian culture, social organisation and resource management, and of their scientific character, functioning and health and their value to tourism. Many of the people involved in international policy processes do not have first hand experience of Fiji's reefs. Instead, they probably rely on written accounts—general accounts about the reefs of the world generally, or of the Pacific region if that is their interest. They may also rely on oral accounts presented at meetings. It is not unreasonable, therefore, to presume that the account in this chapter is broadly similar to the knowledge that non-Fiji Islanders would acquire of the reefs of the Fiji Islands, should they be interested in doing so. It is similar to that taught at USP in Suva, in the Marine Studies Programme. It is, in effect a discourse—a way of thinking about the relationship between Fijians and coral reefs—found in both academia and in policy circles. The sources from which this chapter's story about Fijian reefs has been constructed are themselves a mélange, where accounts of the traditional have been couched in the modern design of academic literature.

INTRODUCING THE FIJI ISLANDS

In Chapter One I described the location of the Fiji archipelago, shown on Maps 1 and 2. Extensive areas of coral reef have formed on the two relatively shallow shelves on which this archipelago sits; the Fiji Platform comprises the main islands, Viti Levu and Vanua Levu, together with many smaller ones while, to the east, other small islands top the Lau Ridge (Zann 1992; Nunn 1998; Vuki *et al.* 2000 p. 756). On these shelves, the living reefs are generally younger than 10,000 years; they cap older reefs mostly formed during interglacial periods more than 120,000 years bp (Zann 1992). All known types of reefs are present: fringing, platform and patch reefs, barrier and oceanic ribbon reefs, atolls, near-atolls,

and drowned reefs (Zann 1992). Individual reefs range from patches a few metres across to fringing reefs a hundred or more kilometres long (Zann and Lovell 1992). The largest, a 370 kilometre broken barrier reef encompassing the Mamanuca and Yasawa islands and the Great Sea reef of Vanua Levu, does not fit any reef classification systems (Andréfouet 2004). This diversity of reef types reflects geomorphological influences: oceanic volcanic history, tectonic uplift and submergence in the Pleistocene and Holocene, erosion of limestone cliffs during interglacial periods of emergence, and rapid vertical growth during sea-level rise (Zann 1992; 1994 p. 53). Map 3 shows the general location of these reefs (this map from Spalding *et al.* 2001 mixes archaic and modern Fijian spellings; it uses the archaic 'th' for 'c' (in Thakau Vau and Thikombia for example) and the modern c (in Cicia for example).

The Fiji Islands were first settled by humans about 3500 years ago, probably by people from New Caledonia and Vanuatu, island groups to the west settled earlier by Austronesian speakers from the New Guinea region. Some of these migrants to the Fiji Islands then moved eastward to the Samoan and Tongan groups, where they developed the social and cultural patterns known as Polynesian. The Fijian archipelago subsequently received waves of people from western Melanesia, and as a consequence, many Fijian people, especially in the hinterland of the two main islands, exhibit the physical characteristics and social organisation regarded as Melanesian. In contrast, in the eastern part of the archipelago where Polynesian influences are evident, the inhabitants of the many small islands maintained regular contact with their Polynesia neighbours over the centuries (Lal and Fortune 2000 p. 567). The people of Rotuma, an outlier 5000 km north of the archipelago are unique within Fiji; their language has traces of Fijian, Polynesia and Indonesian (Lal and Fortune 2000 p. 569). Much of the country's population, totalling around 830,000, lives on the four high islands of Viti Levu, Vanua Levu, Taveuni, and Kadavu; about half live in urban centres on Viti Levu, principally the capital Suva (Fiji Bureau of Statistics 1997; South Pacific Commission 1998; Lal and Fortune 2000 p. 567). Indigenous Fijian comprise around half the total population, and constitute virtually all the population on the smaller islands. The remaining population is mostly Indo-Fijian, descendants of Indian labourers that British colonial administrators brought in to farm cane (Fiji Bureau of Statistics 1997; South Pacific Commission 1998). Other Pacific Islanders and people of European and Australasian extraction add to the contemporary ethnic mix of the Fiji Islands. In accordance with 'official' (state) semantics, I use the term Fiji Islander to encompass all inhabitants of these islands, and the term Fijian to refer to those of indigenous descent. I also use the term Fijian as a general adjective for non-human items.

Although classified as a 'small island developing state', the archipelago is one of the most developed Pacific island groups, although development is largely confined Viti Levu, particularly the capital Suva. In early 2003, per capita GDP was estimated at FJD 4020 (USD 1766) (The Economist Intelligence Unit 2003). The principal industries are tourism, sugar and molasses, gold, fishing, timber, garment manufacturing, and ginger farming (Lal and Fortune 2000 p. 566).

The country is an ex-British colony that became independent in 1970. It has a bicameral Westminster-style system of parliament, both houses racially weighted in favour of indigenous Fijians (Lal and Fortune 2000). Since independence the country has had a democratically elected government apart

from two periods—1987 to mid-1992 following two military coups, and from mid-2000 until August 2001 during which a caretaker government held power following another coup. In 1987 coup leader Rabuka declared the country a republic. It was readmitted to the Commonwealth in 1997, after returning to democratic government, and shortly afterwards adopted a non-discriminatory constitution.

As the capital of the Fiji Islands and the largest city in the Pacific Islands, Suva is a hub of connections with the world. There are, based in the city, diplomatic missions, the regional headquarters for several aid agencies, and NGOs as well as offices of several regional Pacific agencies—the headquarters of Pacific Islands Forum (PIF), the South Pacific Applied Geoscience Commission (SOPAC), USP, plus an office of the Secretariat of the Pacific Community (SPC, formerly the South Pacific Commission).

Social, Cultural & Economic Significance of Fijian Reefs

REEFS AND REEF FISHING IN FIJIAN CULTURE AND SOCIAL ORGANISATION

In the culture of indigenous Fijians and in their traditional belief system, reefs (*cakau*) are part of the *vanua,* the concept that coalesces around the central idea of a bond between people and the land and resources linking these in a triumvirate of respect (Batibasaqa *et al.* 1999 p. 100-102). The *vanua* encompasses the environment in its totality, both human and natural elements. At its heart are the earth, forests and sea that have sustained human life in the Fiji Islands for centuries (Batibasaqa *et al.* 1999 p. 101). *Vanua* includes not only the land and sea—to Fijian communities, nearshore areas are seen as an extension of the land—but also the people, their traditions, customs, beliefs, values, and the various other institutions established to achieve harmony, solidarity, and prosperity (Ravuvu 1983 p. 70).

In traditional thought, Fijians believe they are bonded to land and sea through their ancestors and guardian spirits. They 'inherit' the land from their ancestors and pass it onto succeeding generations (Batibasaqa *et al.* 1999 p. 101). The environment is thus an integral part of one's self, providing the physical manifestation between the living and the dead; it contains the history of one's ancestors in nature (Siwatibau 1984; Batibasaqa *et al.* 1999 p. 101). Traditional Fijian beliefs recognise the existence of invisible supernatural powers in the form of spirit gods of a cosmological nature, as well as spirits of dead ancestors and other kinsmen. Land and sea are associated with the spirits that protect it; the spirits that are part and parcel of the mortal world, watching over, guiding and controlling people's activities and all other earthly things (Ravuvu 1983 p. 35). The threat of the omnipresent gods is a continuous reminder to the people to treat their resources properly (ibid). Reefs are thus places linked to the supernatural and other beliefs. Some were sacred places—sacred fishing grounds to which special rules applied and strictly adhered to. The dead whose spirits inhabited sacred areas showed offence when customary taboos and rituals were not adhered to in a particular area. The sanctity of some areas was such that people were barred from them (Matthews *et al.* 1998 p. 209).

Many Fijian communities are coastal, and for them hunting and gathering of food for subsistence was and still is focused on the sea (Kunatuba n.d.-a p. 3). Coral reefs are places for collecting food and fish. Before motorised boats and ice-making machines, people fished nearby areas—estuaries, shallow intertidal flats, mangroves, lagoons, and reefs (Veitayaki 1995 p. 35). Mostly they fished shallow, intertidal areas inshore of inner reef slopes. Less routinely, they fished reefs, both the submerged coral

outcrops of fringing reefs, and the barrier reefs, from the outer part of the lagoon to the outer reef slope. Both men and women would fish reefs at any time or tide for all kinds of fish. At low tide they would glean the reefs (*vakacakau*) for fish and for shellfish such as clams and *Trochus*; at high tide they would handline (*siwa*, *siwa tutu*; *siwa nunu*) and spearfish (*nunu*) on the reefs. For most fishers this reef zone is the furthermost fishing zone they would visit (Veitayaki 1995 p. 35). Areas seaward of reefs, which played a relatively unimportant role in contributing to people's food supply, were not owned by any specific group or subject to any specific restrictions (Veitayaki 1995).

Fishing is a link with the past in two ways. First, there are traditional customs associated with fishing, including reef fishing. These include the ritual of serving *yaqona* to *gonedau* (master fishermen who fished for chiefs and to fulfil traditional obligations) just before they set out on their traditional function and on their return; the belief that one should not sleep with one's wife the night before a fishing expedition; and the fear that a secretly pregnant woman would affect the success of fishing (Fong 1994 p. 36). People in some areas have special relationships with a particular fish, as totems (Veitayaki 1992 p. 7; Matthews *et al.* 1998 p. 209). These totemic and other taboos restrict particular clans, families, age groups and genders from eating certain types of marine food; for instance in Qoma in Tailevu north of Suva, people do not fish for or eat their totem (Veitayaki 1995 p. 143).

Some of the knowledge about traditional roles is being forgotten; some communities are no longer aware, for instance, of who has the role through their genealogy, of the *gonedau* or master fishermen. But coral reefs are sites to which traditional sanctions may still be applied; a *tabu* may be placed on an area for instance, preventing fishing for a certain period for various reasons, including the death of a high chief and/ or to allow fishing stocks to build up for the *magiti* (feast) (Fong 1994 p. 37). Although many traditional customs are no longer practised today, elements of traditional practice continue to influence the contemporary resource-use system—contemporary practices include features that were once part of the traditional system (Veitayaki 2000a p. 116).

Contemporary Fijian communal ownership of fishing grounds and the right to fish reflects traditional social organisation, another way in which fishing is a link to the past. Traditionally, clan claims and occupation determined ownership of nearshore areas including reefs (Fong 1994). Communal ownership of fishing grounds (to the outer part of reefs) provided food for daily sustenance, plus that needed for obligatory levies paid to chiefs. Owning fishing grounds was also a means of cementing alliances, and a historical record and reminder of those. It was customary to transfer ownership of fishing grounds, particularly isolated reefs, sandbanks or lagoons, to another tribe as a gift for helping in battle, or when highly ranked women married into a neighbouring tribe (Waqairatu 1994 p. 79).

Unlike some Fijian beliefs, a traditional system of resource use and ownership persists (its details are explained later in the chapter). While the ownership of land is vested in *mataqali* and *tokatoka* (terms explained in Table 17), the ownership of fishing rights was vested in larger groups, usually at the *vanua* level but occasionally individual *yavusa* or groups of *yavusa*. This was to ensure that small groups who did not customarily use fishing grounds because of their traditional duties elsewhere as warriors or carpenters for instance, or those who live in the highlands, had the same rights as other members of the

vanua (Waqairatu 1994 p. 82). Thus the system of fishing rights reflects and perpetuates a specific notion of equitable access to subsistence resources.

TABLE 17: GLOSSARY OF FIJIAN TERMS CONCERNING RESOURCE OWNERSHIP

Term	Explanation
Vanua	The confederation of Fijian tribes or *yavusa* (also the environment in its totality)
Yavusa	The largest social unit for Fijians, a tribe of people who share a common deified ancestor from the original migration to the Fiji Islands. In some areas this is a landowning unit. A Fijian village is usually made up of several *yavusa*. In a fully developed *yavusa*, there are several *mataqali*, each custodian of a particular task.
Mataqali	Clan, extended family unit; the most common type of indigenous landowning unit.
Tokatoka	Family unit made up of closely related families with the same blood relative as their head; a recognised landowning unit. The smallest unit in a Fijian village.
I Qoliqoli	Customary fishing areas (areas that groups have rights to fish)

Source: Derrick (1950); Native Land Trust Board web site www.nltb.com.fj/glossory

This system is, however, as much a legacy of British colonial rule as pre-colonial indigenous social organisation. Pre-colonial traditions of most parts of the archipelago indicate incessant warfare resulting in constant reshuffling of groups of people, some going off to establish independent settlements, some seeking refuge among more powerful groups and some submitting to the rule of more powerful conquerors (France 1969 p. 13; Nayacakalou 1975 p. 41; Nation 1978 p. 19; Routledge 1985 p. 28). The colonial administration established after cession to Britain in 1874 required land titles to be registered and land use to be controlled, Governor Gordon elicited the consent of the Council of [Fijian] Chiefs to the notion that Fijian land was inalienable and that there had to be an authentic land-holding unit (McNaught 1982 p. 9). France (1969) describes how the colonial government applied the same rigid kinship/landowning system throughout the islands and established a permanent leadership around land right. But Fijians had 'owned' land not permanently but on the basis of use; they had not lived permanently in villages on one site. France (1969 p. 13) notes the unceasing occupation and vacation of lands was a consistent feature in all the recorded *tukutuku raraba,* the Native Lands Commission's records, in which the tribal history of all Fijian was narrated and preserved. By prescribing and freezing land titles, this codification favoured the largest political confederations (which at that time were in the east and north-east), and strongest chiefs of the time, particular chiefly titles thereafter being associated with particular areas. The legacy of this shapes contemporary Fijian politics. It presumably affected the way that *qoliqoli* were codified after the Native Fisheries Commission was established in 1941 for this purpose; I return to this process later in the chapter.

CONTEMPORARY REEF FISHERIES

The modes of fishing and fishers

Early colonists reported that Fijians lacked the tradition of offshore fishing found in many Polynesian and Micronesian communities, all fishing being from the shore (Hornell 1940; Zann 1992). This is no longer the case (if it ever was). Although not confined to shore fishing, most contemporary coral reef fisheries in the Fiji Islands are still small-scale, low-technology operations however. The most common method of fishing the inshore areas is handlining. Gill nets are also commonly used, and spearing and reef gleaning and skin diving (especially for shellfish and sea cucumbers) are common. Also used are fish traps, fish fences, seine nets, hand nets, fish drives, poisons, and line trawling (Zann 1992; Vuki *et al.* 1999 p. 5). Nowadays, it is not only indigenous Fijians who fish Fiji's coral reefs. In a survey of coastal fisheries in rural Viti Levu, the most populous island in Fiji, a quarter of those fishing were Indo-Fijian (Rawlinson *et al.* 1995).

Women as well as men fish coral reefs. In Fijian communities, labour has traditionally been organised in accordance with gender, with women engaged in domestic duties and fishing and foraging the areas closest to shore, and men responsible for farming and for fishing deeper areas (through diving for instance) (Vunisea 1997 p. 15). The organisation of fishing in contemporary Fijian life still largely reflects these gender roles. As in other Pacific Islands, women in the Fiji Islands dominate shallow water fishing, both for subsistence and, increasingly, for commercial purposes. They tend to fish with other women rather than in mixed-gender groups. Their major fishing activities, both in rural areas and in semi-urban ones, are gleaning and collecting. Women also provide the necessary post-harvest activities for men's catches, whether cooking, smoking, drying and salting. They are the main informal traders, dominating municipal markets and informal outlets (Vunisea 1997).

Women's fishing activities are more common in indigenous Fijian society than in Indo-Fijian society. In a survey of a survey of 2,252 households (representing 13,200 people) in rural Viti Levu in 1993, Rawlinson *et al.* (1995) found that Fijian adult females were the most active group fishing (45 percent of all those fishing). Few Indo-Fijian females fished (less than two percent of all those fishing). More Fijian men fished than Indo-Fijian men. Little else is recorded about the social or cultural importance of fishing in the lives of the Indo-Fijian community in Fiji; it has not the subject of any specific published studies.

Fijians consider fishing to be a valued artistic activity. Skilled fishers and seafarers are highly regarded. Fishing is also an important social activity (Veitayaki 1995 p. 1; 2000a p. 116). In a study of Fijian women in her village (Nadali near Nausori on Suva's outskirts), Vunisea (1997 p. 16) found the majority of women saw fishing as a social activity rather than as work—an opportune time to spin yarns and catch up with the news while doing something useful. While fishing is an important part of Fijian village life, it is never the exclusive economic or social activity of the village. Rather, it is conducted sporadically, when there is a need to fish or when an opportunity such as good weather permits. On particular occasions, a whole community will partake in fishing, men, women and children fishing together (Veitayaki 1995 p. 12).

Reef organisms as food

The food items that rural Fijians harvest from coral reefs are multitudinous, and include fish, molluscs (cephalopods included), crustacea, echinoderms, seaweeds, and turtles. A large variety of fish are harvested (Richards *et al.* 1994; Rawlinson *et al.* 1995; Veitayaki 1995; Kunatuba n.d.-b p. 9; n.d.-a p. 15). In Rawlinson *et al.*'s 1993 survey of rural Viti Levu, researchers listed 109 species of fish taken from fringing reefs for subsistence and commercial purposes, along with crabs, 14 species of other invertebrates, and 14 specimens of 'others'; they recorded an additional 31 species of fish and 11 species of other organisms taken from lagoon areas (Rawlinson *et al.* 1995 p. 49-54, 58-91). At least another 20 fish species associated with outer reefs are fished, including trevallies (Carangidae) and barracudas (Sphyraenidae); these species are generally considered to be in 'less close association' with reefs, are less likely to have been fished traditionally, and are now purchased and eaten, along with tuna (Richards *et al.* 1994). This illustrates the general scientific view that the catch from coral reefs is frequently composed of species of generalists that are only weakly associated with coral reefs, or of species more frequently associated with other ecosystems of food sources such as plankton, sandy bottom, or seagrass meadows (M^{c}Clanahan *et al.* 2002 p. 7).

Fijian fishermen target different food fish, depending on whether or not they intend to sell them. Commercial fishermen target white-fleshed carnivorous species such as cods, emperors or snappers. Subsistence catches tend to contain a higher percentage of herbivores such as parrotfish, yellowfin surgeonfish (*balagi*), and rabbitfish (*nuqa*) (Richards *et al.* 1994 p. 39-40). The size of individual catch items taken for sale is generally larger than of those taken for consumption; some of the latter are extremely small and well under recommended size limits (Rawlinson *et al.* 1995 p. 2). Zann (1992) has suggested that almost any fish or shellfish above a few centimetres in length and non-toxic in nature is likely to be eaten.

Not only food items are harvested from coral reefs. Coastal villages have also harvested Scleractinian corals for 'quite sometime' to use in constructing seawalls and to fabricate ornaments to sell as curios (Viala 1988 p. 1). Coral boulders have also been used in the construction of drains and soakage pits for septic tanks since at least 1965, as required by Suva City Council regulations (Viala 1988 p. 1). More recently, harvesting of corals, reef rock, fish and other reef organisms for the aquarium trade has become a major activity for many costal villages on Viti Levu, a trade discussed further in Chapter Twelve (Vunisea 2003).

Fiji Islanders eat a lot of fish. Recent reports of annual per capita fish consumption vary from 44 to 62 kilograms, much higher than the world average of 13 kilograms (Gillett and Lightfoot 2002 p. 52). Contemporary newspaper stories about Fijian soldiers serving overseas often mention the way they miss having fish as a daily dietary item. "Sunday is not Sunday in a Fijian home without fish" (Fong 1994 p. 40). But quantities of various seafood items consumed throughout the Fiji Islands have never been accurately surveyed, only surmised from the occasional small survey as mentioned above and from estimates of nationwide domestic sales.

For coastal communities, reefs and the shallow inshore areas traditionally provided the bulk of animal protein that Fijians consumed (Kunatuba n.d.-b p. 3; n.d.-a p. 2). In rural areas, few Fijian households

possess refrigeration so fish is eaten the day it is caught. When available, it is eaten at both lunch and dinner. Not all fish eaten come from inshore fisheries. In some rural areas cultured fish such as milkfish and tilapia are now a significant source of protein. Tinned fish, locally canned tuna (caught offshore) or (imported) mackerel, is commonly eaten in urban households, and occasionally in rural ones. In a survey of 50 households in three rural Fijian villages, Rawlinson *et al.* (1995 p. 66-67) found 58 percent of meals included fresh fish and seven percent tinned fish. In Suva, fresh tuna is also available, usually as second grade chilled tuna, in fish and chips for example (*pers. obs.*).

As many Fijians now live in urban centres, and/or work as paid labour, proportionately less of the population engages in fishing on a regular basis than when the population was predominately rural. With this increase in urbanisation and paid employment, demand for fish has increased, along with fish prices (Fiji Fisheries Division statistics quoted in Jennings and Polunin 1996 p. 102).

Reef organisms as economic resources

The most recent estimate of national annual subsistence catches of finfish, shellfish, seaweed and other marine invertebrates is 21,600 tons, valued at FJD 48.6 million (Gillett and Lightfoot 2002 p. 35, 148). Much confusion arises over what exactly subsistence might be and what exactly are subsistence requirements. In noting that the distinction between subsistence and commercial fishing is becoming increasingly blurred, Gillett (2002 p. 4) cited two phenomena that he considered responsible for this—the increasing monetarization of rural economies, and similarities in production (catch methods perhaps) for some species that are both exported and used for subsistence purposes. Certain fisheries in the Fiji Islands are routinely labelled as subsistence fisheries despite the fact when describing fishing practices within a certain household or village, it is difficult to isolate the subsistence component from the commercial one. Furthermore, most women fish without licences and are largely categorised in the subsistence sector whether or not they sell their catch (Vunisea 1997 p. 14).

In many coastal villages and also some inland ones, fishing is the main source of income (Rawlinson *et al.* 1995 p. 1; Veitayaki 1995 p. 12). Much of this coastal fishery is centred on coral reefs and the outer slopes of these. (There is also an offshore tuna fishery in the Exclusive Economic Zone). Artisanal or small-scale commercial fishing within the country has increased rapidly in the last decade or so (Gillett 2002 p. 16). Although in the past, fish and fishery products have constituted an important medium of exchange between communities, Rawlinson *et al.*'s 1993 survey in rural Viti Levu suggested that, although the sharing of catch between Fijian families has not ceased completely, the increased emphasis given to generating cash from selling fish is leaving less fish to share with others (Rawlinson *et al.* 1995 p. 71; Veitayaki 1995 p. 12).

In their 1993 survey of rural Viti Levu, which covered both coastal and inland communities irrespective of ethnicity, Rawlinson *et al.* (1995 p. 1) estimated that 16 percent of households sold marine products for income, mostly fish but also shellfish and shells. Almost nine percent reported it as their major source of income. Far more Fijian households (36.7 percent) sold marine products than Indo-Fijian ones (5.2 percent). Most of the households selling marine products did so regularly, more than once a week (ibid). Artisanal fisheries products are sold as fresh or frozen through municipal markets, hotels, restaurants, cafes, butchers, fish merchants, retail shops and supermarkets, road and

riverside stalls, and the national marketing authority (Veitayaki 1992 p. 6). Income from the sale of marine products is as important in the outer islands as in rural Viti Levu (Rawlinson *et al.* 1995 p. 73).

Certain export fisheries provide a steady income for some rural villages in the Fiji Islands (and elsewhere in the region): bêche-de-mer, live rock, and trochus shell fisheries, along with fish and other reef organisms destined for aquaria. About 20 species of holothurians (sea cucumbers) are processed and exported from the region, mostly to Asia. Villagers in remote locations harvest and process the animals, drying them into a non-perishable product, bêche-de-mer, which can then be stored while waiting transport to the market (Gillett 2002 p. 17). Live rock is exported for use in home aquaria (described in Chapter Five) The shell of the gastropod *Trochus niloticus* is a product which villagers in remote locations can harvest and store until suitable transport is available to take it to market (Gillett 2002). It is exported to factories in Asia and Europe, either whole or first processed in Fijian factories (Gillett 2002 p. 50). The national scale of those trades in considered in the next sub-section.

Export trades in reef organisms and reef material

Amongst Pacific Island groups, the Fiji Islands, Papua New Guinea, Federated States of Micronesia, Tonga and the Cook Islands have the largest commercial coastal fishery sectors (Gillett 2002). The Fiji Fisheries Division reported the total export value of inshore fishery products in 2002 to be FJD 26 million but detailed export statistics in its annual report suggest this could be higher, as summarised in Table 18 below (Fiji Department of Fisheries 2003). By value, the country's main reef products exported are bêche-de-mer, various other marine invertebrates, shells (either unprocessed, as button blanks, or as buttons), coral (both live and dead), ornamental fish, and live rock. Shell exports are mainly *Trochus niloticus* and pearl oysters, either raw shell, button blanks or processed buttons or cleaned shells destined for use in furniture inlays and other decorative items (TRAFFIC 1995; Preston 1997 p. 20).

TABLE 18: ESTIMATED EXPORT EARNINGS FROM MAJOR INDUSTRIES USING REEF RESOURCES, 2002[1]

Industry	Export earnings FJD	Number of major exporting companies
Bêche-de-mer	11.7 million	Seven
Aquarium products	10.2 million	Five
Button blanks (pearl oyster, trochus) and trochus shell	5.7 million	Three
Live reef food fish	1.8 million	Two

Source: Fiji Department of Fisheries (2003 p. 3-4, 44).

[1] In 2002, the exchange rate was around 2.1869 Fijian dollars per US dollar; in 2003 it was 1.8958 and in 2004 1.7331 (CIA 2005).

DETERMINING THE SIZE OF EXPORT FISHERIES

There are no reliable data of the quantity or value of exports of reef products from the Fiji Islands; any reported data should be viewed with some caution (Gillett and Lightfoot 2002). The Fiji government's export statistics are unreliable and independent estimates of some export commodities are markedly higher than official government figures. There are many incentives to under-report (officially report as exported an amount less than actual quantity exported), and the Customs Authority reportedly regards the official recording of fisheries exports as a mere formality (Gillett and Lightfoot 2002 p. 149). Many of the categories under which the Fisheries Department collects data are confusing, with some products (such as bêche-de-mer and giant clams) lumped together; sometimes live and dead specimens are not distinguished. 'Official' estimates about the size of the coral export industry, whether live rock, live coral, or curio coral, also appear to be unreliable, at least up until late 2003 when they were retrospectively reconstructed from industry records, as described in Chapter Twelve, to meet CITES' requirements. Curio coral, live coral and live rock were sometimes lumped together in departmental statistics, and sometimes separated, without this being specified. In the export statistics, sometimes products from different trades are combined (e.g. curio and live corals); sometimes products for one trade are differentiated and sometimes they are not (e.g. coral, fish and invertebrates all destined for the aquarium trade). There is no consistency.

This has two implications for this thesis. First, because there is no consistency in reporting, all such statistics as quoted in Table 18 and in the text below are difficult to interpret and compare. Such statistics give, at best, some idea of the relative size of each export category. Second, this raises the issue of how important the accurate use of statistics is to those employing them to justify policy interventions—in making a case for the global management of a particular environmental problem such as the effects of coral harvesting for instance. This issue is addressed further in Chapter Twelve.

Coral exports

Initial exports of coral from the Fiji Islands were of dead specimens destined for the curio market in decorative and ornamental items made from coral. This export trade commenced in 1984, and the amount exported has steadily risen since, most of the trade being with the US (Viala 1988 p. 1; Lovell and Tumuri 1999 p. 30, 39-40). An export trade in live corals, which also commenced in the mid 1980s, now provides considerably more revenue than the curio coral trade (Ed Lovell, Biological Consultants, Suva, *pers. comm.*). Although revenue figures are not readily available, the live coral trade was estimated to have returned around FJD 12 million in 1999 (Smith 1999 p. 8). This trade is targeted at the home aquarium market, corals from Pacific Island waters considered to be some of the most beautiful specimens available because of their bright colours. At least 56 species of coral are collected in the Fiji Islands for live export (Baquero 1999 p. 6).

In 2002/3 there were seven companies approved by government to export coral, two concentrating only on curio coral, one of which ceased operating around that time (Ed Lovell, Biological Consultants, Suva, *pers. comm.*). Corals are also exported occasionally for medical purposes and scientific research, but only in relatively small quantities (e.g. an estimated 15t in 2001 (Lovell 2001 p. 21; International Coral Reef Action Network c.2002)).

Exports of live reef fish

Fish are exported live for both the aquarium trade and the trade in food fish, described in Chapter Five. Aquarium fish have been collected along the Suva-Beqa-Serua coast of Viti Levu since 1976 (Richards *et al.* 1994 p. 60). The industry has grown steadily since then, with a rapid leap in both quantity and value since the late 1990s (see statistics in Richards *et al.* 1994 p. 60; Fiji Fisheries Division 1998; Fiji Department of Fisheries 2003). All aquarium fish operators are based on Viti Levu (Sovaki 2001, also statements made by industry people at a Marine Aquarium Council workshop in Suva, May 2002). The fish are air-freighted to the west coast of the US and to Europe (Gillett 2002 p. 50). In 2002, an estimated 252,525 fish were exported, with a value of FJD 1.2 million (Fiji Department of Fisheries 2003 p. 44). In 2002-3, there were four companies involved in exporting aquarium fish, another two had relocated elsewhere in the Pacific in the late 1990s when it appeared that the Fiji government was going to place further controls on the collection and export of marine ornamental fish trade, moves discussed in Chapter Twelve.

In 1998, the Fiji Fisheries Division, as part of their commodity development framework, identified the live reef food fish trade (discussed in Chapters Five and Seven) as a potential income-earning project, and commenced a trial in conjunction with one overseas operator (Yeeting 1999; Arritt 2002). The initial (1998) export of 17,088 live food fish in 2000 was valued at FJD 50,161 (Fiji Fisheries Division 1998 p. 45; Arritt 2002; Gillett 2002 p. 48). By 2002-3, two licensed operators in the Fiji Islands were exporting a total of about 26 tonnes per annum, half from Lau and half from Vanua Levu (Ledua Ovisi, Fiji Fisheries Division, Suva, *pers. comm.*). These annual exports were valued at around FJD 1.8 million (Table 18).

Other reef organisms and material exported for the marine aquarium trade

Although the worldwide marine aquarium trade included invertebrate species—clams, sea anemones, sea stars, sea cucumbers, sea urchins, plus a few other species—it is not clear how many of those are exported from Fiji. Presumably amounts of invertebrates exported are small compared to the export of ornamental fish; in 2001 the estimated quantities of exports were of 40,000 cultured clams (*Tridacna*) and 22,000 other invertebrates (International Coral Reef Action Network c.2002).

There is also a thriving trade in the export of live rock chipped from reef flats, usually exported in pieces of 15-35 cm diameter (Lovell 2001 p. 10). Although started in 1984, quantities exported have risen significantly since 1995 (Sovaki 2001 p. 28; Smith 2002). Live rock is bought and sold by weight and for villages participating in the marine aquarium trade, it provides a higher income than exports of corals or other reef organisms (Smith 1999 p. 10). In 2000, there were four companies exporting it (Sovaki 2001 p. 28). In 2001, an estimated 1300t was exported (Ed Lovell, Biological Consultants,

Suva, *pers. comm.*). Live sand, composed of carbonate material, is also exported in small quantities for use in aquaria, an estimated 63t in 2001 (Lovell and Tumuri 1999 p. 14; International Coral Reef Action Network c.2002).

Fresh and frozen reef fish, shellfish, and bêche-de-mer

The commercial export of shallow water reef fish is not a major industry in the Pacific (Gillett 2002 p. 17). In 2000 there was a deepwater snapper fishery on the outer reef slopes in Fiji but this appears to have since ceased (Gillett 2002 p. 48, Johnson Seeto, lecturer, Marine Studies Programme University of the South Pacific, Suva, *pers. comm.*). Fiji is, however, a significant supplier of bêche-de-mer to Asia and has been for many years (Preston 1990 p. 401). The trade peaked in 1988 when over 700 tonnes were exported to China, dropped off, then rose to about the same level in 2002 (Gillett 2002 p. 50; Fiji Department of Fisheries 2003). These production booms are a response to prices generated by a growing demand for the product in Asia (Gillett 2002). Besides bêche-de-mer and cultured clams, Fiji exports a range of (dead) shellfish and other marine invertebrates including sea crawfish, crabs, octopus, oysters, and the adductor muscles of giant clams (Fiji Fisheries Division 1998; Gillett 2002 p. 17; Fiji Department of Fisheries 2003). In Fisheries Division export statistics, it is difficult to determine which fish are from reefs and which are deep sea species.

TOURISM BASED AROUND CORAL REEFS

These exports of reef organisms, particularly those of aquarium fish, have been subject of opposition from the tourist industry. In 2004, over 480,000 visitors were expected to inject more than USD400 million into the Fijian economy (FijiSUN 2004). Coral reefs play a significant part in this industry, much of which is based around coastal resorts, where snorkelling and diving are key attractions on offer. A small but high profile part of the industry is based around live-aboard dive boats. Two British-based operators, Greenforce and Coral Cay, offer scientific experiences to overseas tourists who pay to come to the Fiji Islands and participate in dive surveys monitoring the state of reefs. In addition, a few resorts concentrate on surfing reef breaks and have built an international reputation around the quality of those breaks.

The Evolution of Coral Reef Governance

INDIGENOUS CONTROL OF FIJIAN COASTAL FISHERY RESOURCES

Having considered the local significance of Fijian coral reefs, I now describe systems of reef governance, and the manner in which these evolved. Both land ownership and customary fishing rights, as they exist in the Fiji Islands today, reflect traditional and social organisation of Fijian people as codified by the British colonial government (Waqairatu 1994 p. 79). These rights are thus a link to a pre-colonial past, although not a direct continuance of it. Traditionally, Fijian management arrangements for fishing grounds, reefs included, were embedded in the wider social system in which traditional Fijian authority is based—a hierarchical system of chiefly authority. The customary understandings of resource use that persist, allow access to and ownership of fishing grounds and rights (Veitayaki 1995; Vunisea 2002). Large-scale indigenous groups, usually encompassing several

villages, retain traditional customary fishing rights over sea, rivers and lakes; in some cases, a tribe recognises that certain reefs, lagoons or specific spots belong to a certain sub-group; often a coastal village would have its fishing grounds immediately adjacent to the land it owned, for instance (Waqairatu 1994 p. 82). Not all those with fishing rights are coastal dwellers however; inland villages may have rights to fish a particular area. In the sea, these rights extend from the intertidal to outer reef slopes (Veitayaki 1995; Vunisea 2002). Although the state has ownership rights of marine waters up to the high-water mark, since these were included in the 1874 Deed of Cession to the British Crown, customary owners have legal, proprietary fishing rights over their *I qoliqoli* (fishing areas), as guaranteed under that Deed and assured in later fisheries legislation (Waqairatu 1994).

The above explanation does not do justice to the uncertainty and controversy surrounding the extent of Fijian sovereignty over the sea that has existed since the Cession. Under Clause 4 of the Deed, the islands, waters, reefs and foreshores not properly alienated and not needed by Fijians were vested in Her Majesty and her successors (Pulea 1991). That established Crown ownership over all reefs and territorial waters that contained traditional fishing grounds. At the same time, under Clause 7 of the Deed, 'Tui Viti and other high Chiefs' retained their customary fishing rights over their islands, island waters and foreshore (Waqairatu 1994 p. 80). After Cession, there was some uncertainty as to the ownership of reefs and fishing grounds that were traditionally the property of Fijian communities and were required for use and sustenance (Pulea 1991). Traditional owners were, according to some reports, baffled by the dual systems that had been established, and the way that modern law and alien authority challenged the total authority they previously had over resources (Lagibalavu 1994 p. 270). Consequently, the British Governor assured those at a Great Council of Chief meeting on 5 November 1881 that "measures will be taken for securing for each *mataqali* the reefs that properly belong to it, in the same way as the rest of their land will be secured for them" (reported in Waqairatu 1994 p. 80).

Such legal measures were subsequently taken during the time of colonial rule lasting until independence in 1970, but only slowly. In 1894, Fisheries Ordinance No. III recognised *mataqali's* rights of exclusive fishery on certain reefs and made it unlawful for any other person to fish without obtaining a licence. A similar measure was included in the Birds, Game and Fish Protection Ordinance of 1923 which stated "it shall be unlawful for any person to fish... in any water forming part of the customary fishing ground of any *mataqali* unless he shall be a member of such *mataqali* or shall have obtained a licence from the Colonial Secretary". The same provision was subsequently included in Section II of the Fisheries Ordinance 1942 Cap 154 (Hornell 1940; Waqairatu 1994 p. 80). In effect, this gave the government the right to manage the resources and to permit non-*mataqali* members to exploit the resources. But the 1942 legislation also restricted the powers of the state to determine the use of fishing rights by allowing the owners of customary fishing rights to advise the District Commissioner and the Fisheries Division about which commercial fishers should be allowed to fish their area, also allowing them to impose restrictions on the licences issued by the state[2].

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[2] An Act to make provision for the regulation of fishing [1 January 1942] Cap 158, s13(2).

In 1941, Ordinance No. 4 established a Native Fisheries Commission, with the duty to ascertain what customary fishing rights were the rightful and hereditary property of native owners and to establish title of all customary fishing rights. This provision was subsequently incorporated into the Fisheries Act of 1942 (Pulea 1991). Thanks to the Commission's work, marine tenure is now well defined and registered in most cases (as described in Waqairatu 1994). There are 270 coastal *I qoliqoli* surveyed and registered to Fijian communities (Native Lands and Fisheries Commission, *pers. comm.* July 2003). Over the years, the fishing rights of one island only have been alienated (Waqairatu 1994 p. 79)[3]. Those from particular *mataqali, yavusa,* or any subdivision of these, have the right to fish their own area—the area registered by the Native Fisheries Commission in the Register of Native Customary Fishing Rights.

The communal ownership of many *I qoliqoli* is complex and often disputed (Vunisea 2002 p. 7). Their sizes vary tremendously, from one to 5000 square kilometres, but size does not necessarily have any relationship to the number of people with rights to fish (Cooke 1994b). Some groups have exclusive rights to territories far from their adjacent waters and sometimes separated from rights-holding communities by waters belonging to other Fijian groups (Ruddle quoted in Johannes 2002). I am not aware of any analysis of the effect that the codification of land rights almost a century earlier had on the assignation of *I qoliqoli*, but I assume there was some impact.

A report on fisheries management in the Fiji Islands, prepared by the Forum Fisheries Agency (one of several Pacific regional intergovernmental agency), sets out one view about who has the right to grant approval to fish certain areas, a view that privileges modern law, and the roles of the state and government. Referring to provisions in the Fisheries Act that prohibit the taking of fish for commercial purposes without a licence, it states that:

> Although the seabed is Crown [sic] property, the Fisheries Act recognises the Fijian people's customary right to fish in traditional fishing grounds (*qoliqoli*), generally from the outer edge of the reef to the shore. ... All Fijians have the right to fish in their own *qoliqoli* to catch fish for their own consumption. The Act also allows the owners of customary fishing rights to advise the District Commissioner and Fisheries Division which commercial fishermen shall be allowed to fish in their area and to impose restrictions on commercial fishermen. The customary fishing rights law is executed by the Native Lands and Fisheries Commission, District Administrations, and Fisheries Division (Richards *et al.* 1994 p. xix).

Other descriptions of how this approval system works in practice place more emphasis on the authority of Fijian chiefs relative to the government' licensing agents. These alternative descriptions emphasise how district commissioners (who are part of the indigenous provincial administration system) issue a licence for commercial fishing only after a custodial chief has granted approval (e.g. Yabaki 1994; South and Veitayaki 1997 p. 302; Veitayaki 2000a p. 122). The person wishing to fish must first get the written consent of the registered *qoliqoli* owner. The District Commissioner then translates that into a written permit to fish, which is redeemable for a licence to fish commercially in that area, issued by the Fisheries Division (Cavuilati 1992 p. 50). In order to seek approval from the custodial chief, an

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[3] In 1861 the Tui Cakau sold the island of Mago near Vanuabalavu to a European married to his nephew; at the same time he gifted its bays, waters, lagoons and even turtles (Waqairatu 1994 p. 79).

individual or company approaches him—occasionally a woman is a chief—with a traditional *sevusevu* (presentation ceremony) of *yaqona* (from which kava is made) or a *tabua* (a sperm whale tooth), both valued items (Yabaki 1994; Bowden-Kerby 2003; Vunisea 2003). This occurs even though the Fisheries Act specifies not that fishing rights owners must consent, but that the permit is at the discretion of the commissioner who must consult with the customary owners and the Fisheries Division (Fong 1994). Because the fisheries legislation states that licences are needed to take fish for trade or business, or take fish with other than a spear or portable trap, all Indo-Fijians wishing to fish commercially or from a boat must obtain a licence, and in practice, obtain approval from the respective chiefs of the areas they wish to fish.

In addition to the licence fees payable to the Fisheries Division, a system of goodwill payments has developed; commercial fishermen wanting access to *I qoliqoli* are required to pay these to the relevant chief each year before he approves a licence (Veitayaki 2000a p. 122). This practice is believed to be widespread, with payments ranging up to several thousand dollars, and including liquor, cigarettes and other items in some cases (Fong 1994; Passfield 1994; Cooke 1994b p. 63; Bowden-Kerby 2003). In 1974 the Attorney General declared this practice to be illegal and possibly criminal, although there has not been any convictions since that decision (Lagibalavu 1994 p. 271). In 1980, however, the Great Council of Chiefs decided that chiefs were justified in demanding payments and the practice continues (Cooke 1994b p. 29).

As well as the power to restrict the number of licences issued to commercial fishermen, the *I qoliqoli's* head also has the power to prevent fishing for certain species or in certain areas, preventing the use of certain types of fishing gear, and generally protecting the fishery for the benefit of his own people's subsistence needs (Cavuilati 1992 p. 50). In Lau for example, the paramount chief of the province in the late 1980s banned the commercial exploitation of fisheries in his domain, arguing that commercial fishing makes a mockery of customary marine resource use and promotes a system of resource use detrimental to his people (Veitayaki 2000a p. 123).

Thus, despite the Deed of Cession and despite the Crown assuming ownership of marine waters and seabed, there is strong, ongoing expression of indigenous fishing rights and of indigenous control over all resources that can be fished from inshore waters and reefs. In practice it is the chiefs—and not all chiefs, as only some seem to be giving approvals—who exercise the right to control fishing access to areas.

Since independence, successive Fijian governments have supported this style of governance. For instance, when in the 1980s, Cabinet approved guidelines for various fisheries (aquarium fish, bêche-de-mer, giant clams, lobsters, and corals), these had a common intent of restricting fishing to Fijian nationals as far as practicable, ensuring the fisheries only operated with the approval of resource custodians; involving village fishermen as much as possible, and directing fishing first to uninhabited islands and reefs (in order to save the reefs for use by villages). The current government's policy regarding fishing within any customary fishing rights area is that no commercial fishing activities should be undertaken there unless the consent of chiefs and the people having the right to fish is obtained (Government of Fiji 2002a). In 1982, the Great Council of Chiefs requested new legislation to

clarify the situation and avoid future arguments about ownership of land beneath seas bordering Fijian land. Based on this long-standing request from the Great Council of Chiefs, recent governments have vowed to ensure, that in law, indigenous Fijian have full ownership rights over customary *qoliqoli.* The Soqosoqo Duavata ni Lewenivanua (SDL) government, elected in 2001, has also made this pledge (Pacnews 1999; Pareti 2001). In 2003 this overwhelmingly indigenous SDL government, elected after a caretaker government held power for a year after the 2000 coup, announced its intention to prepare legislation to transfer full proprietary rights for traditional fishing grounds to indigenous Fijians, to remove the confusion over resource ownership. The government began this process shortly afterwards (Radio New Zealand 2004). In mid-2004, Cabinet approved, for public consultation, a draft Customary Fisheries Bill, intended to confer proprietary ownership of foreshore land, within customary fishing rights areas, on the traditional owners of such rights. At the time, MFAT (2004) quoted the Attorney General, Senator Qoriniasi Bale, as saying, that "The right conferred does not grant exclusive possession to such traditional owners since it will not interfere with the right of public access or the right to innocent free passage recognized under international law". Earlier discussion around the bill had evoked expressions of concern from the private sector, especially in the tourism industry, which fears that access to the foreshore will be affected (ibid).

Day to day management responsibility for Fijian reef fisheries

As in many other Pacific Islands countries, local Fijian communities have continued to manage local fisheries despite government regulations and the establishment of fisheries departments (Dalzell *et al.* 1996). The majority of reef fisheries in Fiji Islands are managed under an approach mixing traditional methods with state involvement through a system of honorary fisheries wardens (Cavuilati 1992; Jennings and Polunin 1996). The Fisheries Division appoints honorary wardens nominated by the *qoliqoli* owners. These unpaid, part-time wardens are responsible for implementing national fishing laws and any restrictions placed on permits. Some wardens receive training from the Fisheries Division or from NGOs such as WWF (Matthews *et al.* 1998 p. 325).

National regulations are not necessarily enforced or respected (Kailola 1995 p. 4). For instance, Jennings and Polunin (1996) found that seasonal closure of the turtle fishery and bans on the collection of turtle eggs were sometimes ignored. On some reefs adjacent to urban areas, traditional management practices no longer operate, fish yields have decreased and habitat-destructive fishing methods such as the use of explosives have been adopted (Jennings and Polunin 1996 p. 102). In national fisheries legislation, *mataqali* members may take fish from their own *qoliqoli* but need a licence to sell fish as a business; these licences are personal to the holder (Kailola 1995 p. 4). There seems, however, to be a tendency for indigenous Fijians to regard fishing in their own *qoliqoli* in order to sell that fish as much their right as fishing for subsistence food. Kailola reported that fishing activities of women in particular are regarded as subsistence whether or not they are commercial in intent eg fishing for mangrove crabs (Kailola 1995 p. 5). Bidesi (1997) reported that Fijian women did not seem aware of the need to have a licence for commercial fishing (see also Vunisea (1997 p. 14)).

There are several different types of management method documented in the literature describing community fisheries management in the Fiji Islands. These include the banning or placing taboos on

certain methods eg dynamite fishing or spearfishing with scuba and fishing gear, often gillnets (Fong 1994; Veitayaki 2000a). Areas may be closed to fishing (declared *tabu*), usually for a specific period of time, occasionally indefinitely, for the reasons discussed earlier (Veitayaki 1995 p. 142; 2000a p. 124).

There are several documented instances of Fijian chiefs or communities adopting specific measures to address perceived overfishing or declines in catches, summarised in Johannes (2002) and in Veitayaki (2000a). For example Fong (1994) described a variety of measures instituted in Macuata Province between 1989 and 1994, including bêche-de-mer closures, restrictions on gillnet use and on spearfishing using scuba. Matthews *et al.* (1998 p. 223) described how the villagers of Kaba Point, a relatively isolated village near Suva, concerned that their fishing catches had declined to a quarter over five years, decided to restrict the use of efficient gear such as gillnets, to ban the taking of coral, and to protect mangrove forests. Cooke (1994a p. 181) mentioned how communities near Ba in northern Viti Levu had closed areas of reef from fishing for a year of more, and placed taboos on dynamite fishing, also in response in declines in fish stocks. A World Bank study of six villages listed various restrictions made locally (on areas and species able to be fished, days of fishing, techniques, or whether outsiders would be allowed to fish) (World Bank 1999). It is possible that many other Fijian communities have adopted similar measures, since many of the 270 coastal *qoliqoli* are unstudied. Other traditional practices, although not ostensibly methods of managing fisheries, may also contribute to conservation.

While these traditional methods are used in some places to restrict the total amount of fish caught by limiting the number and types of approval granted, in other places *qoliqoli* members have disagreed with their chiefs over 'excessive' granting of approvals and have cited conflicts between subsistence and commercial fishing. This is one of the issues which the Fiji Locally Managed Marine Area (FLMMA) initiatives, discussed in Chapter Eleven, seeks to address. (It also aims to stop traditional owners passively allowing national officials to make most of the management (as opposed to allocation) decisions about fisheries; the extent to which fisheries management decisions are made locally occurs varies from *qoliqoli* to *qoliqoli*).

Traditional management arrangements are enforced through traditional authority which means there are protocols to follow. The social structure and close-knit units in Fijian communities demand that people strictly follow tradition and respect each other. The marine resources are collectively owned, and in most communities, management decisions and policies are based on consensus, which ensures the cooperation of everyone on the community. The rights of individuals within their collectively owned fishing area are related to the groups' consensual position (Veitayaki 1998 p. 51-52). The traditional system is an effective way of ensuring compliance. Nonconformists are harshly treated and this is an effective deterrent to others in the community (Siwatibau 1984).

THE EVOLUTION OF STATE FISHERIES MANAGEMENT

Although interested in protecting rural Fijian's rights to maintain their subsistence livelihood, British administrators of the Fiji colony were largely indifferent to fishery marine issues, apart from some high value exports of invertebrate species (Adams 1993; Adams 1998 p. 129). In the early years of British administration, they passed some fisheries legislation to give a measure of basic protection to stocks of

food-fish and shellfish (e.g. *The Pearl-shell Ordinance of 1899* and *The Trocas Shell Fishing Ordinance of 1919*), but failed to employ fisheries officers to enforce these (Hornell 1940 p. 1, 45-46). To better control professional fishermen, including 'aliens' fishing in Fijian territorial waters, they passed legislation in 1942 requiring vessels to be licensed (since customary shore fishing practices did not involve boats) (Hornell 1940 p. 19-20).

Over the years, as problems were perceived the colonial administration added other bits and pieces of legislation to protect specific resources (Adams 1993). The Fisheries Regulations Cap 135 1966 restricted acceptable fish sizes and fishing equipment, licences, and periodic seasonal restrictions. In 1970, further regulations prohibited the taking, sale, or even possession of triton shells and giant helmet shells, a measure arising out of the crown-of-thorns starfish scare in the 1970s (see Chapter Five)—these shellfish are predators of the starfish.

It was not until two years before independence in 1970 that a Fisheries Department was established separately from the Department of Agriculture (Van Pel 1956; Veitayaki 1995 p. 17). After independence, the government focused almost exclusively on fisheries development, set out in national five year plans (Veitayaki 1995 p. 17). In 1977 it extended its legislative responsibilities to cover Fiji's newly declared Exclusive Economic Zone (EEZ), adopting the Marine Spaces Act—Fiji was the first nation to sign UNCLOS (Cavuilati 1992p. 45; Adams 1993). Like other post-independence Pacific Island state fisheries department, the Fiji Islands government has spent much of its time promoting fisheries and aquaculture development, dealing with problems in the commercial export fisheries, and managing foreign investors and other externalities (Adams 1998 p. 129; Veitayaki 2000b).

Today, the Fisheries Division within the Ministry of Fisheries and Forestry administers virtually all policy and environmental matters related to oceans and coastal areas; it also issues collecting licences for harvesting live coral and any other organisms living in aquatic ecosystems, mostly to Fijian villagers rather than to coral traders or companies (Sovaki 2001 p. 27-28). The Department of Lands (in the Ministry of Lands and Mineral Resources) has a minor role concerning licences to extract sand, gravel and dead corals plus foreshore occupation licences[4]. The Department of Environment has a role in policy development on environmental matters including biodiversity, as described below.

State Policy on Coral Reefs

FISHERIES POLICIES AND CONCERNS ABOUT OVERFISHING

Fisheries policies, some embodied in legislation, some in guidelines approved by Cabinet, form the bulk of the Fiji government's policies about coral reefs. These policies cover export trade in coral, marine ornamentals and reef fish exported live for food consumption. They provide for indigenous management of coastal fisheries, place regulatory control on some fishing practices, seek to control

[4] Under the Crown Lands Act 1946 Cap 132, the Director of Lands and Survey is responsible for issuing licences to extract sand, gravel and dead corals. The Lands Department uses this legislation to issue mining licences to those harvesting boulder-like colonies of *Porites* coral from Suva Harbour, for use in septic tank systems—even though these are colonies of live coral (Lovell and Tumuri 1999 p. 37).

commercial investment in most reef and lagoon fisheries, and provide for government control over exports of fish and fisheries products (Cavuilati 1992 p. 51-52; Gillett 2002). The Fisheries Division regulates inshore fisheries, addressing user conflicts and controlling the exploitation of fishery products. Its goals are to increase production to satisfy local demand; maximise yields through improved regulation, optimising distribution of effort and controlling destructive fishing practices; generate employment opportunities through fishing and fish processing; and to add market value to marine products for export through improved handling and further processing (Cavuilati 1992 p. 38).

Current fisheries legislation contains the following centrally-administered state controls on reef fisheries, some dating back to colonial days, other added by post-independence governments, and consolidated into Fisheries Regulations in 1992:

- requirements for commercial fishers to be licensed each year;
- bans on taking of turtle in certain months; and on the taking of triton, helmet shell and porpoise;
- bans on the export of certain products such as giant clam meat, turtle meat and shell;
- minimum size limits on several reef fish, trochus, pearl shell, turtle, bêche-de-mer and mud crab;
- gear restrictions on coastal gill nets (minimum net sizes);
- bans on certain fishing methods: the use of dynamite and chemicals for catching fish, on driftnets, and on gillnets in rivers (Cavuilati 1992 p. 51-52; Gillett 2002 p. 52).

As mentioned in the last chapter, the Fisheries Division has undertaken little stock assessment. Rather than controlling commercial fisheries on the basis of biology, it has largely left their control to economic factors (cost of harvesting, purchase, freight, handling costs etcetera) (Kailola 1995 p. 11). Stock assessment only became a significant issue in the 1990s when accounts of overfishing burgeoned. In the early to mid-1980s reports about Fijian reef fisheries stated that overfishing was generally not a problem, although reef fish stocks were under heavy pressure near main population centres. Since then both the subsistence and commercial fishing pressure has increased, and there have been reports of local depletions of some species and species groups— reports reproduced in the GCRMN national status reports summarised in the previous chapter. While there is some concern about certain fish species, some species of sea cucumber collected for the bêche-de-mer trade, and turtles, the prime concern is the depletion of the larger, sedentary invertebrate species. The latter are easily collected and an export demand exists (Zann 1992; Fong 1994; Richards *et al.* 1994 p. 40, 104-109; Adams *et al.* 1996). The gold-lip pearl oyster (*Pinctada maxima*) and two species of giant clam (*Tridacna gigas* and *Hippous hippopus*) are already extinct and stocks of another clam species *Tridacna derasa* are considered depauperate (Richards *et al.* 1994 p. 159; TRAFFIC 1995). According to Richards *et al.* (1994 p. 155), few black-lip oysters remain because of a combination of heavy fishing pressure in some places, and land-based pollution in others. Additionally, stocks of trochus appear to have steadily declined under exports demands, first for raw shell in the late 1980s, then for button-blanks (Richards *et al.* 1994 p. 149).

The Fisheries Division has tackled the over-exploitation of sedentary species (mainly giant clam, trochus and sea cucumbers) in several ways, including seeking to strengthen the role of traditional fishing rights owners, and through publicity to increase awareness about the vulnerability of these

species (Cavuilati 1992 p. 46-47). Other strategies have included the culture and export of giant clams; restocking areas which have been overexploited (bêche-de-mer and pearl oysters); encouraging alternative sources of income (e.g. cultured seaweed, milkfish, and tilapia) and diverting effort to offshore areas, supplying fish aggregating devices for instance (Gillett 2002). As well as controlling some exports through legislative means, it has encouraged the establishment of exporters' associations prepared to take a responsible attitude towards fishery exploitation.

CORAL REEF CONCERNS IN OTHER GOVERNMENT POLICIES

Environmental policies

As well as fisheries legislation, the Fiji Islands has a suite of laws concerned with environmental management. Most of these are a relic of the colonial period when environmental issues were sectoral and, compared to today, of limited scope. At least 25 Acts, administered by 14 different ministries, government or statutory agencies contain environmental management provisions. Most of these laws are either old or ineffective in the modern context, or are not enforced for various reasons (Pulea 1991; Government of Fiji 2002a). The government of the Fiji Islands has signed many international conventions relating to environmental matters (listed in Appendix II of Turnbull 2001). Several, some regional and some more truly international in scope, contain provisions concerning the coastal and marine environment, although none relates specifically to coral reefs. The government has yet to meet many of its obligations it undertook when signing those agreements (Turnbull 2001).

It has, however, adopted a (non-statutory) national environmental management strategy, prepared by Asian Development Bank consultants in an effort to rationalise and modernise the country's environmental management, and approved by Cabinet in 1993 (described in Turnbull 2001). Much of that strategy is yet to be implemented, although the government drafted a Sustainable Development Bill which, after several drafting changes, severe editing over almost ten years, and a recent name change to the Environment Management Bill 2004, has been approved by Cabinet and is scheduled to be tabled in Parliament (Kumar 2004). The downsized, redrafted and renamed bill requires certain national environmental reports and plans, amends the current system for environmental impact assessment of development proposals, and adds a permitting system for pollution control and waste management (Kumar 2004 p. 150-151).

Although coral reefs occupy an important role in the lives of Fiji Islanders, the state did not accord them a significant place in policies developed in order to bring the Fiji Islands into line with international environmental standards, at least until 2003 and the events described in Chapters Eleven and Twelve (concerning locally-managed marine areas and the control of trade in reef organisms, respectively). For the government, reefs are a key political resource in its efforts to cement its electoral support amongst indigenous Fijians. Perhaps for this reason, most of the state governance arrangements covering reefs were (and indeed still are) targeted at fisheries, a legacy of the colonial administration which initiated fisheries legislation. In seeking to ensure that legal ownership rights of customary coastal fishing areas reside with indigenous Fijian *qoliqoli* members, the government is planning to

reduce the state's governance role in reef fisheries to an advisory one. The responsibility for setting policy would, presumably, then reside entirely with the *qoliqoli* owners.

The SDL Government's development policies

The SDL government, under the leadership of Laisenia Qarase who had also headed the previous caretaker government, prepared two major strategic planning documents that collectively contain its overall policy framework. One is the *20-Year Development Plan (2001-2020) for the Enhancement of Participation of Indigenous Fijians and Rotumans in the Socio-Economic Development of Fiji*, commonly referred to as the blueprint for affirmative action, which Qarase and his SDL team promoted extensively during the 2001 pre-election campaign. The other is the *Strategic Development Plan: 2003-2005* (respectively Government of Fiji 2002b; Ministry of Finance and National Planning 2002).

The sections on fisheries in these documents express the government's goal of sustainable utilisation and development of fisheries and marine resources and contain policies to support development of the sector, promote production and export of value-added fisheries products, and provide appropriate institutional and physical infrastructure. The blueprint also expressed the government's intention of promoting indigenous Fijian participation through ownership in/of marine resources and marine resource processing companies (Government of Fiji 2002b; Ministry of Finance and National Planning 2002). As general aspirations for coastal fisheries, these differed little from the government fisheries policies during the 1980s, except the explicit desire to see more indigenous ownership of processing companies as well as of marine resources. What was new, however, is the way that the government's commitment to the state's obligation to protect and safeguard the rights and interests of indigenous Fijians and Rotumans share the stage with its aspirations for 'proper' environmental management and sustainable use of natural resources, as expressed in the section on environment in the strategic development plan. That section was derived in part from the Johannesburg Plan of Implementation adopted at WSSD, which the Prime Minister and a government delegation attended.

Neither strategy document directs much attention to coral reefs, although the strategic development plan does acknowledge that some reefs are under threat from pollution, erosion and mining. It also states that unsustainable use of resources in the artisanal fishery is becoming a concern, and that crustacean, mollusc and bêche-de-mer fisheries are under "considerable management pressure" (Government of Fiji 2002b p. 7.4). But the only specific commitments to addressing these impacts are a proposed moratorium on reef mining and national controls on coral harvesting. There is a general commitment towards having provisions related to fisheries resources in the Sustainable Development Bill (now superseded by new legislation explained in Chapter Twelve), plus a commitment to preparing a management plan for customary fisheries rights.

Biodiversity policy

Since 1997, the government has been developing a National Biodiversity Strategy and Action Plan, in accordance with its obligations under the CBD. A Global Environment Facility (GEF) grant

administered by UNDP funded this initially[5]. The SDL Cabinet reviewed progress in 2003, and allocated the task of supervising implementation of the plan to the Department of Environment, although not approving the strategy as government policy (Department of Environment 2003).

The National Biodiversity Strategy and Action Plan (NBSAP) is a list of 104 planned actions, designed to give effect to 27 objectives. It makes no specific mention of coral reefs; these are encompassed with provisions about marine resources. The strategy provides for the effective management of both threatened species and species of cultural significance, and of invasive species. It seeks to establish a comprehensive and representative core protected areas system supplemented by conservation areas set up by landowners and traditional fishing rights owners (Government of Fiji c.2003). Running through the strategy is the notion that communities have an important role to play in the management of *qoliqoli* and should be treated fairly, and supported and assisted to conserve biodiversity and to preserve traditional knowledge, innovation and practices. It encourages traditional fishing communities to actively manage their *qoliqoli* and to establish or reinforce protected areas through appropriate traditional conservation measures (Action 20 in Government of Fiji c.2003). This echoes the same preoccupation with indigenous rights seen in the SDL government's development policies.

CONCLUSION

This chapter has begun to explore, not just the relationship between people and coral reefs in the Fiji Islands, but the various stories, narratives, arguments, and discourses that shape those perceptions and influence policy. For Suva, as a meeting place for those storylines and discourses, is the place where the international meets the local in matters of policy. The international environmental policy discourse is pervasive in the city—in documents of agencies concerned with environmental and development matters, in the everyday talk of those working in agencies (state, non-governmental and intergovernmental), and in the media. Yet there are other discourses present, influencing policy, as the expression of indigenous rights in the government's environmental and fisheries policies illustrates.

There is a gap between the pressing political concerns of the Fiji government and the discourse of global environmental policy. The exigencies of electoral competition are driving forms of devolution, privileging some local interests, and pushing national environmental policy in a particular direction. At the same time, the state bureaucracy, agency by agency and institution by institution, engages in international environmental policy relations on the one side and relations of local control and governance on the other. This then is the backdrop for recent efforts to enrol the Fiji Islands into the imagined crisis facing coral reefs worldwide, explored in the next three chapters.

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[5] Project FIJ/97/G31; budget USD 197,925 (www.undp.org.fj/Energy,Environment,GEF.htm accessed 15 June 2001)

Chapter Ten

The Role of Local Agency in Determining the Fate of 'Foreign' Discourses

Introduction

In the sphere of international policy, Suva is a moment in which the global is being invented afresh, akin to Amin's (2004 p. 43) "forcing ground for challenges that are thrown up when difference is gathered so visibly in one place and when a globality of myriad flows and connections is temporarily halted in one place". Here, different discourses, narratives and expert policy technologies meet and mix. The discourse of global environmental policy meets development discourse meets a discourse about indigenous rights with its storyline of rightful Fijian ownership of reefs. Stories about the uniqueness of Fijian culture and the close relationships of Fijians to land and sea, summarised in the last chapter, mix with environmental narratives about the need to protect coastal and marine environments and the coral reef crisis narrative. The result is a mélange, a messy reality.

Continuing from Chapter Eight's descriptions of how GCRMN national reports are constructed and Fijian reefs incorporated into the global crisis facing coral reefs, this chapter examines how, in Suva, local agency at the intersection of various discourses, shapes local policy. Establishing a theoretical argument about how local agency co-opts and uses environmental discourses of foreign origin, it discusses three examples: the ideas of sustainable development and vulnerability, and the crisis narrative.

The Nexus of Agency and Discourse

INTERNATIONAL ENVIRONMENTAL POLICY DISCOURSE IN SUVA

In Suva, links with 'the outside' through foreign aid and diplomacy are strong, providing a conduit for discourses of 'foreign' origin to reach the Fiji Islands. This is especially so in environmental matters. The Fiji Department of Environment relies heavily on overseas aid, using aid funds to undertake almost all its programmes (Bhaskaran Nair, Permanent Secretary, Ministry of Local Government, Housing and Environment *pers. comm.* July 2001, quoted in Turnbull 2001). The NBSAP and the Sustainable

Development Bill (in the form it was before being shortened and redrafted as the Environment Management Bill 2004) were two outcomes from a raft of environmental aid projects directed at the Fiji Islands over the last twenty-five years (Turnbull 2001). As a result, the Fiji Islands has been incorporated into the sphere of the discourse of global environmental policy.

Sustainable development

The concept of sustainable development is particularly visible. Almost everyday, Suva's daily newspapers run stories about one or other initiative designed to deliver sustainable development. In a previous study of environmental management techniques in the Fiji Islands, I showed that élite in government have co-opted the concept of sustainable development for the purpose of promoting indigenous peoples' rights to development. As a result, those practices have far less rational and democratic bases than one would expect either from the underlying logic of the techniques used (such as environmental impact assessment and environmental planning), or from the way those techniques are applied in western, industrialised countries (Turnbull 2001; Turnbull 2004 p. 64).

> The chiefly élite have much to gain from promoting, on one hand, the communal ownership of native land and fishing rights, and chiefly income from this and, on the other hand, further economic development in Fiji in which they invest (Ward 1995: 247-8). They actively promote the state-led model of development, involving the government in attempts to control the course of economic development. Ward (ibid) suggested that it does not matter that these ideas (communal land ownership and economic development) may be antipathetic, so long as they are kept on separate levels—achievable provided the Fijian élite continue to control both the discourses and the political stage. Western methods of environmental management have been applied in the Fiji Islands state sector in ways that avoid bringing these different discourses—that of economic development and that of Fijian communal land tenure and leasing—into conflict. This can be seen in the way government is using conservation to divert attention from the differences between the lifestyles of urban political and social élite and those in rural villages, by offering development, including access to overseas funding, and development through conservation and ecotourism initiatives. It can be seen in the practices of environmental impact assessment, environmental planning and protected area practices. This pattern is clear even though various parts of the state apply these three environmental management techniques in ways that are poorly co-ordinated, without any overall statutory framework for environmental management. It has been achieved through the way the state refrains from developing policy about appropriate environmental quality (since any national standards developed should also be applied to apply to native land); restricts and avoids public participation (since this would give others a chance to comment on practices of indigenous Fijians); generally avoids assessing threats to the environment, native flora and fauna except in the context of hotel investments and some industrial developments (overlooking indigenous use of native land and coastal areas); and steers away from monitoring changes in environmental quality especially on native land. Governments have refrained from implementing plans prepared on their behalf when these do not give adequate consideration to Fijians' rights to use native land—the national environmental management strategy, for example (Turnbull 2004).

These élite are cooperating in international ventures such as aid projects and capacity-building not because they may have been socialised into the discourse of global environmental policy and thus into thinking cooperation is appropriate and good for all. Instead, as this example shows, people are co-opting key storylines reflecting discourse to suit their particular, local situation and interests. These dynamics and interests are driving the way the state interprets and applies the concept of sustainable development. This is why the state's use of these environmental management techniques does not

appear to be sustainable development as it is more widely known: a way of involving the citizenry in decisions about the desired quality of that environment, allied with a precautionary use of state regulation and ecological controls to prevent environmental damage before it occurs, both combined with the pursuit of economic growth. This realisation, that an élite cadre are employing a combination of storylines as political as well as economic resources, is important in understanding the connections between the international and Fiji Islands on matters of coral reef policy examined here and in the next two chapters.

An example: the vulnerability argument

The storyline about the vulnerability of small island developing states is another example of how, in the Pacific Islands, local agency is co-opting and transforming the discourse of global environmental policy. This is an outwardly-directed argument, found in policy engagements where the Fiji Islands are connected to the international sphere of policy. It has become routinely espoused in many political settings both within and outside the Pacific. Although sometimes centred just on environmental vulnerability, it generally concerns various types of vulnerability, and is applied not just to Pacific Islands but to small island states around the world. In part, this concern about vulnerability derives from fears of impending climate change, backed by the scientific predictions summarised in the text box below.

Despite uncertainties in the predictions for the region, mentioned in the text box, Pacific Island governments view climate change as a major disaster and have openly and repeatedly criticised the industrial nations for failing to take definitive steps towards abating pollution of the global atmosphere (UNESCAP 2000). In particular the governments of Tuvalu and Kiribati, along with the Maldives in the Indian Ocean, whose nations are entirely based on extremely low-lying coral atolls, have been calling for international action to slow climate change (WWF c.2003b). The Alliance of Small Island States (AOSIS) has been particularly vocal in forwarding this argument. AOSIS was formed at the Second World Climate Conference in 1990, in response to concerns about impending climate change on the small islands. It was formally convened as a negotiating group in time for the first meeting of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change, held in early 1991 (AOSIS c.2002). AOSIS ensured some basic positions and concerns of island states were reflected in the convention. The alliance continues to play a significant role in negotiations, pushing its policy agendas at WSSD, and at the Barbados Programme of Action Plus Ten meeting in Mauritius.

Climate Change Predictions for Pacific Islands

Predictions about climate change in the Pacific Islands region, based on the four climate change models used by the IPCC plus a few more intensive studies, suggest that there will be significant changes in mean climate and increases in sea-level in the region. According to the *IPCC Third Assessment Report on Impacts, Adaptation, and Vulnerability*, the projected increase in mean annual temperatures for the Pacific Islands region to the 2050s is 1.6 degrees Celsius; to the 2080s it is 2.5 degrees Celsius. Sea levels are likely to rise, region-wide sea-levels continuing to track global trends in the longer term. These predictions are presented with less certainty than the IPCC's global predictions, regional trends being are less clear than global ones.

In the Pacific Islands region, concern centres not so much on slow trends in mean conditions, but on the effects of more frequent extreme weather and climate events. There is already large interannual variability induced by the El Niño Southern Oscillation (ENSO) phenomenon. While the IPCC report suggested that there is likely to be little change or small increases in the amplitude of El Niño events over the next 100 years, more recent trends indicate that surface temperatures in the tropical Pacific are becoming more El Niño-like, a trend that many models project will continue. The combined effect of a predicted increase in the intensity of cyclones (increased maximum tropical wind speeds and lower central pressures) and sea-level rise are considered a major threat to the region.

There is, however, still considerable uncertainty over how climate may be changing and how this will affect the Pacific Islands. There is, for instance, some doubt about whether the intense El Niño events of 1982 and 1997 resulted from a natural variability in global temperatures, rather than from human influences (such variability being discussed in Cobb *et al.* 2003, for instance). Natural shifts in sea-level associated with the recurring ice ages complicate predictions about how severe any sea-level rise associated with global warming might be. There are also difficulties in predicting sea-level changes at local level. Regional trends in sea-level rise are complicated by geological processes that cause land to uplift or subside; there is also some debate over the appropriate timescale at which to monitor sea-level changes.

Source: UNESCAP (2000); Hay (c.2001)

The argument about the vulnerability of Pacific Islands states is being derived from a much broader spectrum that just climate change, however. The texts of AOSIS are full of references to various types and sources of vulnerability: vulnerability to natural disasters, ecological and environmental vulnerability generally, economic vulnerability, vulnerability to exogenous economic and financial shocks, and to globalisation generally. Their basic argument is that as small island developing states seek sustainable development, they face disadvantages, some geographical, some economic, some environmental. They therefore require special attention to ensure their unique concerns are taken into

account. They need assistance to "build and retain the capacity to achieve sustainable development and a degree of self-sufficiency" (AOSIS 2002). They need "the right technology, information and capacity training to undertake adaptation strategies... [and they need] access to adequate and predictable sources of financial assistance so they can effectively undertake adaptation activities" (Slade 2002). SPREP has played a key role in getting small island developing states recognised as a special case for environment and development, first as part of Agenda 21 at the Earth Summit in 1992; then through the Barbados Programme of Action which elaborated upon this in 1995, and at WSSD in 2002 which re-accepted it (Tutangata 2002; AOSIS c.2002). SOPAC has developed an environmental vulnerability index, comparing countries, first within the Pacific then around the world (Kaly and Pratt 2000). Vulnerability has thus become a comparative measure, a way for governments to measure their vulnerability relative to others, and thus to judge whether they should receive international priority for special attention and what degree of assistance they deserve.

This notion of the fragility and vulnerability of the Pacific environment requiring special care recurs throughout the regional environmental plans prepared by SPREP. In many regional policy documents, the adjective 'fragile' is used to describe the Pacific environment as if the two concepts always go together (SPREP 1998 p. ii; 1999 p. 1). The concept has become black-boxed—this is a discursive mechanism: when an object is black-boxed it no longer needs to be reconsidered or justified and the contents of the metaphorical box become a matter of indifference (Hajer 1995 p. 272). The basis for describing the environment as vulnerable and fragile is generalised, ignoring differences between and within Pacific island countries (as I argued in Turnbull 2001). This supports the implicit argument that the entire Pacific Island environment is in need of special care and therefore requires external assistance to address environmental problems. The contrasting argument, that Pacific Island socio-ecological systems are resilient, as argued by Barnett (2001 p. 986-987), could also be interpreted as empowering. Yet it barely features in regional policy discourse, occurring only in some documents related to climate change, including adaptation assessments and suggestions (such as Hay and Sem's (2000) regional synthesis of national assessments of vulnerability and adaptation to climate change).

By stressing their vulnerability, small island states such as the Fiji Islands are emphasising both their moral authority and their demands for special treatment and compensatory counteraction. Victimhood can be provocatively empowering, as Chappell highlighted (1995 p. 309-310). Ratuva (1993) has pointed out how at USP, perceptions of the smallness, fragility, and vulnerability (geographic, social, economic and political) have been emphasised in various disciplines in the social and physical sciences, resulting in a burgeoning number of experts in all aspects of Pacific life. "Pacific business, Pacific economics, Pacific banking, Pacific cooperatives, Pacific accounting, Pacific management and Pacific this and that. They legitimize their existence by capitalizing on our smallness ... in the process carving out small empires they claim to be exclusively theirs" (1993 p. 95). This is another example of how élite in the Fiji Islands employ concepts (of development and environmental policy) to suit their own situation and interests.

Although the vulnerability argument originated in dependency theory in opposition to modernisation theory's view of developing countries, and it underpinned Third Worldism as discussed in Chapter

Two, it has since metamorphosed into a form of neo-Gramscian consent to modernisation theory's domination of the environmental-development nexus in contemporary international policy. Included in the argument about vulnerability of small island developing states is an agreement to cooperate in matters of international policy, an agreement made without letting hold of the idea that the North is to blame for environmental problems (global warming being the classic example) and should therefore pay to fix them. In other words, the espousal of island vulnerability has changed from an external critique of modernisation theory, to an internal one *sensu* Banuri, further strengthening that theory.

Thus, following this line of theoretical argument, the transformation of discourses is not necessarily the result of networks of resistance operating perpetually among dominant, hegemonic discourses and subjugated knowledges as Bakhtin theorised (as discussed in Litfin 1994 p. 38). It may well be the result of employing or co-opting storylines to suit a particular interest group, maybe a professional group—but not necessarily a subjugated group or one intending resistance. Rather, it may be a group that sees the advantages of certain storylines, co-opts them, and adapts them to suit its own interests.

The concept of habitus (discussed in Chapter Four) adds another perspective to this. Following Bourdieu's concepts, experts and élites have a habitus they use strategically. Habitus gives them command of a range of expert discourses (such as sustainable development and vulnerability), their expertise being constituted by showing that they can draw on these to 'solve' local problems of concern. This, in turn, confirms them as experts in their field.

In the following section, I employ this concept when analysing the (dis)connections between the coral reef crisis narrative, various international efforts collecting data on the state of Fijian reefs, and formal government policy. I show how habitus and the strategic use of discourses can entail choosing *not* to reproduce, in local situations, certain storylines that arrive from overseas, or choosing to reproduce them selectively.

The Fiji Islands and the Crisis Narrative

TEXTS ON CORAL REEF DEGRADATION: SITES OF ENCOUNTER IN SUVA

Amongst those working on GCRMN matters in Suva, one would expect to hear discussions of the crisis facing coral reefs, as imagined in that narrative. In encouraging local coordinators from Pacific Islands and other developing regions to attend various international workshops and meetings (such as the International Coral Reef Symposia in Bali in 2000 and Okinawa in 2004), and paying the costs of those trips, GCRMN has kept those people (such as Reuben Sulu, Chapter One) immersed in the particular storylines and arguments that characterise these endeavours. Yet, outside of the national and regional reports prepared according to the standard format and sent off to be incorporated into the global status report, these connections have not been extended across the city of Suva (*pers. obs.;* also interviews).

In the Fiji Islands, narratives, stories and images about national and global coral reef degradation are encountered mostly in Suva. At USP they are to be found in the texts and papers used for courses, in the library, and in the physical process of preparing country and region reports for the GCRMN global status reports. They are encountered at regional meetings and workshops convened by USP or other

regional Pacific agencies such as SPC and SPREP—for example, the ICRI Pacific workshop in 1995, SPREP's marine aquarium trade workshop in Nadi in 2001, and a live reef fish food trade workshop in Suva in 2002. They are to be found in the documents produced by those regional agencies and sent to other regional agencies and to government and academic agencies based in Suva (SPREP's ICRI strategy produced in 1996, for example). These narratives, stories and images about coral reef degradation are also encountered in documents which local NGO offices obtain through their communications with sister offices around the world, with other NGOs, and in meetings amongst NGO staff. IGOs and MEAs incorporate those narratives, stories and images about coral reef degradation into the text of documents and communications (e.g. the Green and Shirley report on the coral trade), which are then sent to government departments, such as the department of fisheries and environment, and the Prime Ministers office.

The notion that coral reefs are a problem is being incorporated into reports prepared for and by regional Pacific agencies, including SPREP's state of the environment reports on the Pacific, and consultancy papers on climate change such as Hay and Sem (2000)'s valuation and regional synthesis of national assessments of vulnerability and adaptation to climate change, prepared for SPREP. It was incorporated into a *Vulnerability and Adaptation Assessment for Fiji* prepared by International Global Change Institute of the University of Waikato in partnership with SPREP and the PICCAP Fiji Country Team in 2000. That report recommended protecting coral reef systems by reducing coral extraction activities, siltation and pollution incidence (Government of Fiji 2004 p. 19-20).

Although those discussions and texts may refer to coral reef degradation, the crisis narrative, described in Chapter Six, is found only occasionally. During four years of research in the Fiji Islands, at a time when the notion that coral reefs were facing a worldwide crisis was already topical overseas, it became apparent to me that the idea that coral reefs are being degraded around the world to such an extent that they are facing a worldwide crisis has not been disseminated successfully to the Fiji Islands. For instance, at the Pacific Islands Regional Oceans Forum held in Suva in February 2004, coral reef degradation was not considered a significant issue worthy of note: there were no ICRI or GCRMN presentations on the state of Pacific reefs. Nor was the coral reef crisis mentioned in the Pacific Islands Regional Oceans Policy which the Marine Sector Working Group of the Council of Regional Organisations in the South Pacific and which Forum leaders endorsed in 2002 (this is available on www.spc.int/piocean/forum/New/policy2.htm). The coral reef crisis does not feature in the draft national assessment report that the Fijian government prepared for Barbados Programme of Action Plus Ten; although coral reefs are mentioned a few times in this, there is no sense of crisis (Government of Fiji 2004). At a WWF workshop designed to prepare a vision for the conservation of Fiji's marine biodiversity (discussed in Chapter Eleven), the facilitators did not cite the global coral reef crisis as justification for the process they were asking participants to perform; in justifying the workshop they simply referred to general international concerns about the loss of biodiversity. The effects of widespread coral bleaching are barely mentioned in any reports on the Fiji Islands or recent environmental forums concerned with coral reefs. Although the coral reef crisis narrative is reaching Suva, through news items, scientific papers, NGO campaign literature and web sites, policy and

meeting papers of IGOs, scientific and ecological text books, it is not being embedded into government policy, an active field of endeavour in that city.

Fiji Islanders are being encouraged into cooperating in international coral reef policy matters by the discourse of global environmental policy rather than by the coral reef crisis narrative *per se*, the discourse being pervasive in Suva. The next two chapters examine various examples of this cooperation, ranging from NGO conservation projects to government regulation to market-based certification scheme. But first, this chapter concludes by re-examining the various initiatives assessing the state of Fijian reefs, described in Chapter Eight.

GCRMN IN THE FIJI ISLANDS

The data that these initiatives generate and feed into overseas-based databases is potentially available to inform Fijian domestic policy. Yet, in domestic policy debates little use is being made of the overview of the state of reefs and reef management compiled as part of the GCRMN status reporting. Policy analysts and decision-makers in various Fijian government departments generally have poor access to the data generated by these international initiatives assessing the state of reef health. There is no central data pool or single point of responsibility for reef health within government; and no central collection in Fiji of all the relevant data on Fijian reefs or even the collection of all material in a single library. Indeed, much of the Fijian material listed in the literature section of ReefBase is not in any of the regional or government libraries (in August 2004, there were 178 references on the Fiji Islands listed, 20 able to be downloaded in full). Not all GCRMN global status reports are in Fijian libraries. Many government staff, unless they are employed on an international aid-funded project or towards the top rungs of the Fijian public service, do not have good Internet access or even reliable printing and photocopying facilities. Accessing ReefBase, the CITES database of coral exports, and a Global Marine Aquarium Database run by WCMC, all of which are Internet based, is therefore problematic for many (and impossible and unthought-of for villagers).

There is little awareness in Fijian policy circles of the data and reports available on the state of Fiji's reefs. A topical example of this is the preparation of Fiji's national assessment report for the Barbados Programme of Action Plus Ten, a significant international policy process. The National Planning Office policy analyst drafting this national report (collating input from various departments) had included only a few snippets about coral reefs provided to him and, when interviewed in early 2004, was unaware of ReefBase, the GCRMN or its status reports (Josefa Sania, Ministry of Finance and National Planning, Suva, *pers. comm.*). Yet he was not new to the task, having prepared the national report for WSSD.

None of these international initiatives gathering data of the health of Fijian reefs are organised to forward data in a useful form to those parts of government that formulate policy about coral reefs. Furthermore, Fijian communities owning the rights to fish reefs do not have access to the information being collected for international reports and databases, nor (with the exception of some Coral Cay and Greenforce work) is any effort being made to communicate it to them.

While the local office of GCRMN collects data from a wide range of sources and sends it to Penang (the World Fish Centre) and to Townsville (the GCRMN global coordinator) to be incorporated into international reports and databases, this in itself does not make it accessible to policymakers in the Fiji Islands. Reef Check and academic researchers do not have any systems organised to forward their information on the state of Fijian reefs to policy analysts, nor to the communities with rights to fish *qoliqoli*. Scientific tourism operators do have a direct link to policymakers. As a condition of their permits to operate, these operators forward material to the Tourism Department. But those reports are not in a format that departmental staff can easily use in formulating government policy (Manoa Malani, Tourism Department, Suva, *pers. comm.*). They are little more than sets of data, and are not put into a context that departmental policy analysts find useful.

Interpreting the (dis)connection

As Chapter Eight showed, orthodox accounts of coral reef policy (such as the GCRMN global status reports) are couched in the language of capacity building and tend to attribute the fact that information on the state of Fijian and other Third World reefs has not been incorporated into government policy to local, technical factors such as inadequate technical equipment, poor access to data and no central data pool within government; they label those as a lack of capacity, resources and experience. Inadequate technical equipment, poor access to data and lack of a central data pool are obviously part of the reason why these reef data are not being used to shape national policy. So too are the difficulties posed by multiple projects concentrated on the same set of reefs—disparate forms of data held in different locations and published in different formats.

But these difficulties are not the only reason. These international monitoring and assessment initiatives do not themselves contain specific mechanisms designed to connect to policy processes within the countries where data are collected. Furthermore, nobody involved in the international governance of these endeavours seems to be making a conscious effort to remedy this, and those prepared to fund international coordination appear reluctant to fund participation in local policy processes. While the international managers of the ICRI and GCRM networks have made considerable effort to connect with international policy organisations and events, they have not directed the same effort to ensuring the local parts of their networks are connected into domestic policy processes. These monitoring and assessment initiatives do not themselves contain specific mechanisms designed to connect to policy processes within the countries where they collect data. Although the GCRMN is designed to reach out to policy makers, it has not had the mechanisms to disseminate any policy messages through its current mode of operation in the Pacific. (This may change as WorldFish Centre opens a ReefBase office in Nouméa, New Caledonia, with French funding; see Chapter Seven). With this potential exception, those prepared to fund international coordination appear reluctant to fund participation in local policy processes (a view expressed by Southwest Pacific GCRMN node coordinators at USP, Cameron Hay and Reuben Sulu, *pers. comms*). Instead, they concentrate on funding top-down coordination, assuming that governments (ie of those countries with reefs) should take on the role of disseminating their policy ideas locally role. In other worlds, they assume that because they (the donors) see this as a priority, so too, should those governments. The international managers of the ICRI and GCRM networks have

made considerable effort to connect with international policy organisations and events (Chapter Seven). They have not, however, directed the same effort to ensuring local parts of their networks are connected into domestic policy processes in the Pacific (various interviews and observations in Suva; and with Mary Power, Pacific Regional Environment Programme, Apia).

There has been a tendency in the texts of GCRMN and ICRI to describe any lack of connection, or lessons not being taken up into national policy, as a 'failure' and to attribute it to a lack of local political will and of 'capacity' (e.g., Wilkinson 2004 p 8, 31). In these orthodox accounts, there is no place for explaining this failure to utilise data on coral reef degradation to form remedial national policies as a deliberate priority-setting decision on the part of those agencies. While orthodoxy might see this 'failure' as part of planned capacity-building projects to be realised when funding become available, it cannot, however, see it as directly reflecting these international agencies' political priorities and these international experts' professional interests. Orthodoxy cannot perceive of this 'failure' as deliberate decision on behalf of those managing the international operations of these ventures to concentrate on the international sphere of policy from where the professional rewards and funding come.

Nor does orthodoxy conceive of GCRMN node coordinators—the gatekeepers of information on the state of Fijian reefs—making a deliberate decision not to pass on the information to government. Orthodox, modernist interpretations of agents in the discursive field of international environmental policy see local people as either following (and therefore socialised into) the orthodox thinking and practices of the field, or as failing to follow proper environmental practices, and therefore lacking in 'capacity', technical expertise and experience.

Amongst those in Suva involved in the GCRMN process of compiling the status reports, and in the node coordination generally, there has been a reluctance to push the GRCMN message into national and regional policy. For the GCRMN node gatekeepers in the Fiji Islands, the local situation makes it nonsensical to try and sell to the country's policy makers, ICRI's message that coral reefs are in crisis, suffering worldwide degradation. While there is local degradation and depletion of some high value species, probably no-one seriously believes that this will extend over all 10,000 square kilometres of reef in the next 50 or so years, or that the majority of coral reefs of the Fiji Islands will undergo significant changes in community structure, becoming algal dominated.

This example, the GCRMN, has shown how orthodox, modernist interpretations of agents in the discursive field of international environmental policy are inadequate because they see local people as either correctly socialised into the orthodox thinking and practices of the field or as failing to follow proper environmental practices. The example also shows how habitus can explain policy disconnections between the global and the local as well as connections. Locals may use storylines and policy processes for their own purposes and not necessarily in ways that a donor or global project coordinator might intend—in this case writing the national and regional reports in standard format when paid to do so, and engaging with the international for the professional advantage and resources that brings. In reading the local situation, they may also choose *not* to reproduce certain storylines or to propound them to government policy analysts and policymakers, or they may do so selectively.

CONCLUSION

This chapter shows agency operating in the international and the local spheres of policy: habitus, the co-optation of storylines to suit local situations and advance local interests. This is the same agency theorised in Chapter Eight to describe those, such as Wilkinson, operating in the international sphere of science/policy (who, of course, are in their own local situations). Yet, just because experts' agency operates in much the same way on either side of the oft-supposed divide between developed and developing country, with much the same motivations, that does not somehow neutralise hegemonic situations. Case studies in the next two chapters illustrate how hegemony exists, even as local experts co-opt storylines for their own purposes.

Chapter Eleven

Conservation NGOs as Modernisers

Introduction

This chapter focuses on coastal and marine conservation, encompassing coral reefs. It explores the socio-political dynamics of two NGO initiatives, dissecting their expert policy technologies and evolving social technologies. This builds on the idea of agency (habitus and the co-opting of storylines to suit situation and interests) being the same in both the international and the local spheres of environmental policy. Revealing more of the political assembly around a global environmental crisis, and of the hegemonic nature of western policies intended to address that perceived crisis in developing countries, the chapter shows how ecological politics get built— partly through agency of experts pursuing professional advantage and partly through the technical practices of NGOs using policy technologies based upon rational planning. The chapter also begins to explore how modernisation, effected through these technologies, distances local policy from the local.

The expert policy technologies examined are ecoregion visioning, specifically the Fiji Integrated Marine Ecosystem Initiative (FIME) and the idea of creating Locally-Managed Marine Areas (LMMA), which in the Fiji Islands appears as the FLMMA network mentioned in Chapter Nine. The processes of applying these two policy technologies in the archipelago involve different NGOs, one large (WWF), several small. Some are Fijian, some international.

In the Fiji Islands, WWF (whose nature and governance was described in Chapter Seven) is involved in both these policy technologies. WWF has a significant presence in the Fiji Islands, having set up a regional South Pacific office in Suva in 1990, then a country programme in 1998.

METHODOLOGY: STUDYING WWF AND FLMMA

This chapter evolved from my decision to study how WWF influences coral reef policy. I picked FIME and FLMMA because they seemed to represent different ends of the spectrum: conservation from above and conservation from below. I was curious to see if this was a case of irrational management, organisational schizophrenia, or part of some greater strategy. These two projects involved different alliances outside the Fiji Islands, the local players in each interacting with different outside groups. But were the storylines and arguments that local players encountered and used different in each case?

Because of the differing form of these two initiatives, I used different tactics to investigate them. I investigated FIME largely through WWF's visioning workshop (Table 19), as a participant–observer. I asked if I might attend and was invited on the same terms as other participants. When attending, I declared my dual interest to all other participants and constrained my own argumentative input so I had no chance of radically altering the outcome. Before and after the workshop, I interviewed several WWF staff about how the organisation functioned, particularly at policy level. In contrast, I investigated FLMMA mainly by observing, over two years, how its participants portrayed the network—in written accounts, at conferences and workshops and in interviews. Having discovered the links between FLMMA and American NGOs I investigated this, through interviews, Internet searches, and by reading the articles the NGO staff had published (e.g. in the journal *Conservation Biology),* the latter explaining the paradigms they were seeking to establish. In contrast to FIME, FLMMA was not a process of public participation. Although people interviewed readily shared their thoughts and documents, I was never invited to participate in any FLMMA processes.

Ecoregion Planning: Fiji Integrated Marine Ecosystem

WWF-SOUTH PACIFIC AS A POLICY AGENCY

One of the main work thrusts for the regional South Pacific office of WWF (WWF-SP for short) is conservation policy, on scales from the local to the international (WWF South Pacific 2002b p. 6). Its efforts to influence international policy range from encouraging international agencies such as the European Union, ADB and World Bank to reduce the environmental impacts of their aid and lending processes in the region, to participating in international summits—the preparatory phases of international summits (WSSD and Barbados Programme of Action Plus Ten) as well as WSSD itself (ibid). WWF-SP endeavours to co-ordinate Pacific Islands 'civil society participation' in major international conferences and in key policy areas such as climate change and biodiversity. WWF-SP also tries to influence international policy by feeding ideas up through the WWF network (Dermott O'Gorman, former head of WWF-SP Programme Suva, *pers. comm.*).

In trying to influence policy within the region, WWF-SP works directly with regional intergovernmental organisations. WWF staff have participated in several regional policy working groups, and assisted in preparing the regional action strategy for nature conservation (WWF South Pacific 2002b p. 6). In working with communities, WWF-SP and WWF-Fiji also seek to change policy at that level. This can have the effect of changing national policy, as happened recently when, in working with a Fijian community on Ono Island, Kadavu, WWF-Fiji helped them set up, and convinced the government to gazette, Fiji's first marine conservation area, Ulunikoro (WWF South Pacific 2002b p. 8).

In its Fiji work, WWF draws upon a range of expert policy technologies and storylines. For instance, in supporting MAC's instigation of a certification scheme for the marine aquarium industry (discussed in the next chapter), WWF draws upon both a neoliberal argument about the value of market-based approaches to conservation and one about the value of community conservation. Ecoregion planning (introduced in Chapter Three) is another expert policy technology upon which WWF draws. It has established a Pacific EcoRegion Centre in Madang (PNG), which WWF Australia, WWF-UK, WWF-US, WWF Netherlands, and WW-SP jointly fund.

ECOREGIONAL PLANNING FOR FIJI'S MARINE ENVIRONMENT

Bringing ecoregion planning in the Fiji Islands

Of the major conservation NGOs using ecoregion planning, WWF is the only one to have applied it to the Fiji Islands. Of the sixteen Global 200 ecoregions in the Pacific, WWF-SP selected five on which to work, two forest ecoregions and three comprising coral reefs and associated ecosystems: Bismarck-Solomon Seas area (Papua New Guinea, Solomon Islands and Indonesia); the Fiji Barrier Reef; and the coral reefs of French Polynesia and the Cook Islands (WWF South Pacific 2001). (Chapter Seven introduced the Global 200 scheme.) The Fiji ecoregion was selected because of its barrier reefs. Although originally included in the Global 200 as a region globally significant for its barrier reef, as specified in Olson and Dinerstein (1998 p. 17), the area defined for the Fiji Integrated Marine Ecoregion (FIME) expanded to include everything between the coastal margin and the outer exclusive economic zone (EEZ) boundaries—from estuaries to deep water trenches. Although ecoregion planning is designed to address transboundary issues—the distribution of (nonhuman) species being defined biogeographically rather than geopolitically—in defining boundaries for the Fiji ecoregion, WWF matched them to political ones, encompassing the entire Fijian archipelago, Rotuma, plus the EEZ around both.

WWF-SP first contemplated ecoregion planning in 2000, but much of the first three years was spent hiring local staff (ie Fiji Islands citizens), familiarising them with the concept and WWF's approach to it, then shaping WWF's general approach to the local situation (Dermott O'Gorman, programme head at WWF-SP, Suva, *pers. comm.*). In this WWF-SP and WWF-Fiji staff, under O'Gorman's leadership, networked with other WWF offices involved in similar processes. They designed the FIME process in accordance with WWF's general procedure for ecoregion planning, aiming to prepare a conservation plan for the Fiji integrated marine ecoregion based around a vision compiled in map form. That vision

would be produced with consultation with the government, interested agencies, and scientific experts; the conservation plan would specify the goals for biodiversity conservation over the next 10-15 years and the actions needed to achieve this. As it turned out, WWF staff subsequently refocused the process on preparing management plans for the Cakaulevu (Great Sea Reef) off the coast of Vanua Levu and the Bligh Waters (Lomaiviti), two areas designed in the Fiji Islands visioning workshop as being 'globally outstanding' in terms of their biodiversity (Fiji Government 2004).

WWF-SP began the public phase of the Bismarck-Solomons Seas ecoregion project in August 2002, progressing through a series of national workshops to a visioning workshop in July 2003. The Fiji visioning workshop followed in December 2003 after a couple of preliminary meetings (Table 19).

TABLE 19: KEY CONSULTATIONS IN WWF'S FIJI ECOREGION PLANNING PROCESS, 2002-04

Event	Date	Those involved (besides WWF)	Achievements
Initial consultation	14/ 5/02	Experts from USP, SOPAC, NGOs and scientific tourism operators; government officials (11 in total)	Steering group set up; various resource management initiatives in the Fiji Islands mapped
Steering group meeting	28/2/03	Experts from USP, NGOs and scientific tourism operators; government officials (25 in total)	Group familiarised with WWF's ecoregion planning process; details of process to be used at biodiversity vision workshop debated
Stakeholder dialogue	1/12/03	Representatives from government departments NGOs, scientific tourism operators, USP, and some Fijian communities	Ideas about how the FIME process relates to existing government policies and plans
Visioning workshop	2-4/12/03	Overseas experts in conservation and coral reef ecology; representatives from Fijian government departments, Fiji-based NGOs and tourism operators, USP, the Lau, Macuata and Cakaudrove communities and Laje Rotuma Initiative (about 70 plus WWF staff)	35 areas identified as outstanding for marine biodiversity; five of global significance. Areas needing further biological reconnaissance and research identified. Suggestions about how to incorporate this information into government planning and policy
Management planning workshop	17-18/8/04	Conservation practitioners and scientists, including a few international experts on reserve design	Draft management plans for the Cakaulevu (Great Sea Reef) and Bligh Waters areas.

In running this workshop, local staff drew on WWF experiences in similar processes elsewhere (particularly the Sulawesi-Sulu Seas ecoregion programme in Indonesia) and their own experience in the Bismarck-Solomons Seas programme. I describe the visioning process in some detail here because of the insights it gives into how WWF staff deliberately sought to shape conservation policy by employing an expert policy technology specifically designed for that purpose.

The FIME visioning workshop and the map produced; a description

The FIME visioning workshop brought together more than 70 people over three days to collectively consider Fiji's marine biodiversity and ecological processes and collaboratively set priorities for conserving these. The introductory material provided to participants described it as a process to:

> ...identify and prioritise key areas of Fiji's marine biodiversity. Based on existing knowledge and the best scientific expertise available, the workshop will develop a vision for marine biodiversity that can guide decision makers, conservation practitioners and key stakeholders in the design and implementation of future efforts to conserve marine biodiversity across Fiji (WWF 2003 p. 1).

Those at the FIME workshop came from a variety of organisations, mostly 'experts' from academic and scientific agencies, tourism ventures, and conservation NGOs. There were also a few government representatives, mainly from the Fisheries Division, the only Fiji government agency with any significant marine expertise. Eight people from different parts of the Fiji Islands, mostly men, were invited to be 'community representatives'. The latter were invited in the notion of a trial; participants at the Solomon Seas-Bismarck workshop had criticised WWF for excluding communities altogether (Reuben Sulu, IMR, USP, Suva, *pers. comm.*. December 2003). Yet, eight people from six provinces do not turn the process into a community planning exercise. These community representatives were treated as experts in their communities, segregated into their own group during sessions and producing their own 'expert' map which was collated with those from other groups, as described below. So, while at one level, this appeared to be a democratic, participatory planning process, people were invited as experts rather than as interested parties, suggesting this was technocratic rather than democratic planning.

Introducing the workshop objectives at a preceding introductory session for government agencies, Gishlaine Llewellyn, one of several staff that WWF brought in from overseas offices to run the workshop, spoke generally about the loss of marine biodiversity and naturalness, trends in degradation, and local extinctions. In doing so she gave the impression that, like elsewhere, the seas around the Fiji Islands, and the creatures inhabiting them, are at risk. In this manner she justified conservation interventions without at any time discussing the nature and extent of degradation in local seas. Instead, she evoked whatever vision people held in their heads of change at a particular locality, and invited them to use that in forming a vision for Fiji's marine biodiversity in 50 years time.

Llewellyn described the ecoregion planning process as a bridge designed to feed better science into planning and policy processes. She said the intent was to "be pure" about dealing with biodiversity first, only adding a layer of threats later (the workshop never reached this stage). She asked the participants to keep some general "principles of conservation" in mind throughout the entire process, listing these as representation; ecological processes; viable populations and resilient habitats; and special elements (including remnants).

The workshop process took people from a range of backgrounds—everyone had been invited to attend, although some (like myself) had solicited that invitation—and required them to work cooperatively for three days, to reach consensus over a vision map for the Fiji Island's biodiversity. Over three days,

WWF staff directed participants through a series of structured discussions and mapping exercises. They kept some measure of control by insisting the groups discuss and address any disagreements; they laid down the rules, firmly coerced the groups to complete their allotted tasks, and provided advice on any matters that threatened to derail or hold up the process.

After consulting each participant about their interests, WWF staff had allocated each to one of five working groups charged with considering a particular ecosystem type (one being coral reefs and lagoons) or in one case, species of special conservation interest. Each group was given a map of the Fiji Islands and surrounding seas and asked to discuss and map areas they considered important for that ecosystem or species. On the second day participants were reshuffled into six new groups, each assigned a particular subregion to consider. These reshuffled groups were asked to use the information mapped by all groups on the previous day (digitised overnight by a WWF staff member) to identify, rank and map parts of the subregion as being of local, subregional, national or global significance. WWF staff encouraged people to draw bold, sweeping lines around areas with some interesting feature: "I should think we want relatively straight lines", said Dale Worthington, head of WWF-SP and one of the group facilitators. They encouraged them to generalise one property so that it represented an entire area, so enclosed: "It's OK to rank an area internationally significant on the basis of only one species", said Bronwyn Goulder of WWF's New Zealand ecoregion support initiative, the Suva workshop facilitator. The participants obliged.

These maps were again digitised overnight and overlaid to produce a new map, a collation of all the group decisions aggregated into large areas deemed significant and thus worthy of protecting. At a plenary session the following morning, the workshop facilitator presented this as a draft showing areas ranked in relative importance, participants discussing and refining it, producing the map shown here (Figure 5).

Discussion of the mapping process

Although the instructions sent to participants before the workshop stated there had been an extensive literature review and analysis prepared, no such material was provided at the workshop despite requests for it. Even when some participants had brought written materials, there was no time allowed for the group to read and consider these. The entire mapping was done using whatever knowledge, interests and biases existed in people's heads and were articulated around the mapping tables. It was informal, anecdotal, top-of-the head stuff, mostly at a very basic, intuitive level. An outsider subsequently looking at the final map depicting thirty-five areas as outstanding in terms of biodiversity, would probably presume far more analysis and expert scientific research had gone into preparing it that actually occurred.

The final map is assumed to represent the place that Fiji biodiversity occupies in world importance—but without any actual comparisons being made with other places, or any criteria for what might be of global significance. There was no discussion or guidance given on what might constitute global significance; this rating just evolved out of group discussions, allowing parochialism to come to the fore. People's personal associations with a particular area certainly affected how they rated it (*pers. obs.*). The group I was in acknowledged this but did not know how to balance someone's specialist

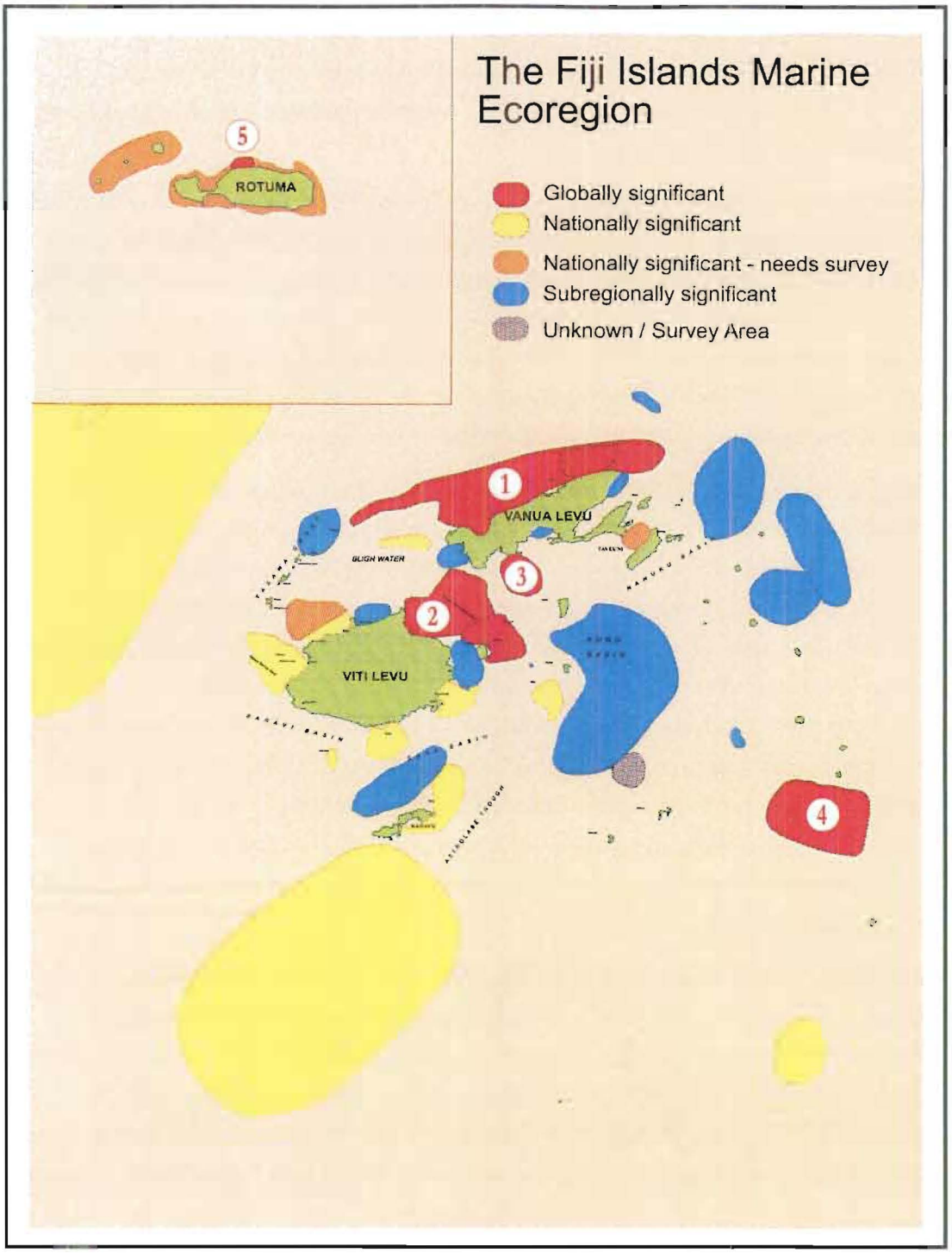
knowledge of an area with the prejudice that this brought to the ranking. They tended to bow in sympathy to the expert, although on one occasion, when someone from another group visited to put his opinion about the worth of a particular area, they discarded that as being overblown enthusiasm for that area. While within these groups, people talked about some issues fundamental to the mapping and ranking processes, including the philosophical basis for scientific conservation values, these debates did not reach the collective plenary discussions.

In its ranking of significance, the mapping process created an opportunity for people to use the process for a preset agenda if they wished. At various times, people in my groups spoke of two such agendas. David Olson of the Wildlife Conservation Society was thought to be using the process to highlight how Lomaiviti/ Bligh Waters, an area he had been promoting as a World Heritage Area, has international significance (something my group rejected but the plenary accepted). Etika Rupeni of WWF was accused of doing the same for Cakaulevu (the Great Sea Reef) supposedly because he wanted funding to run an exploratory diving expedition there (Stuart Gow, Resort Support, Suva, *pers. comm.*.).

The workshop process was designed to reduce the complexity of everything in the extensive seas around the Fiji Islands to priorities coloured on a simple map. It made the 'marine' legible, by homogenising and simplifying it, using technologies of visualisation involving mapping, categorisation, and ranking. This involved taking one or two particular pieces of information, generalising it over a much larger area, and capturing it by drawing a line on a paper map, subsequently digitised into a colourful one on which all the information discussed over three days was reduced to 35 areas of varying sizes, each circled by lines and allocated a grading. The map and accompanying list is complex nature reworked into a set of work priorities for conservation practitioners. It thus became a justification for further conservation work, both research and 'policy engagement'. The map is simultaneously a current ranking and a vision for 50 years hence. This overlooks how ecosystems change with time, they do not all move in the same direction; the map thus decoupled the space-time linkages of ecology.

In this mapping process, the workshop rewrote large areas of the EEZ as important fisheries, ranking them as nationally significant in their entirety—sweeping generalisations based on virtually no information. It rewrote the coastal strip as a residual, left after past human activity had degraded it. As a residual, this strip was deemed worthy of recognition and protection if it had a special feature. Enough special features, even one of particular significance (e.g. blue coral on Rotuma, turtle nesting on Namena Island, or the long barrier reef Cakaulevu), and it was deemed of international significance.

FIGURE 5: THE FIJI ISLANDS MARINE ECOREGION MAP PRODUCED BY THE FIME WORKSHOP



1. Cakaulevu
2. Vatu-i-Ra Passage
3. Namena Barrier Reef
4. Southern Lau
5. Rotuma

Reproduced from an article in *South Pacific Currents*, WWF-SP's quarterly newsletter, which described the FIME visioning workshop (WWF South Pacific 2003a).

Pickles observed (2004 p. 145) that "Maps no longer seem to simply represent territory, but are understood as producing it, in important ways 'maps precede territory', they inscribe boundaries and construct objects that in turn become our realities". FIME's mapping process produces both conservation territories and conservation identities—identities based on relative conservation significance. It thus puts a new (conservation) spin on the traditional cartographic function of cataloguing the 'important' (Pickles 2004, p. 20). At the same time, it sets out to change how people see the world they inhabit, how they see the Fiji Islands, in the manner that Pickles (2004, p. 66) comments upon in his discussion on "deconstructing the map".

Digitising the map legitimates its paucity of content. So, too, does its use of colour; the globally significant areas being coloured a bright red to highlight their importance (Figure 5). Having been digitised, the map becomes a strategic resource for WWF to use as it wishes (cf. Andrews 2001, p. 23). Staff can include it in whatever magazine articles, brochures, reports and web-sites they choose; they can email to others to do likewise, further legitimating its content. This brings to mind that process that Pickles (2004 chapter 8) calls creating cyber-empires in digital space. One can, for instance, imagine the FIME map being added to ReefBase's online geographic information system of all coral reefs in the world, sometime in the future.

Interpreting the FIME process

Ecoregion planning in general, and the FIME process in particular, has attempted to draw on the supposed universality and objectiveness of science. WWF sought to depict the process as being scientific in nature, and those involved as scientific experts. They sought to identify the perspective of the Fiji Islands as a site of biodiversity of particular significance as scientific, and the process they used to rank these as scientific. Yet the process did not meet certain widely accepted scientific standards. It did not systematically evaluate existing information about the marine biodiversity of the area. There was no opportunity for the final map and list to be peer reviewed. Nor was there any opportunity to develop more scientifically robust criteria when it became obvious that the ones participants were expected to use were problematic. The process was dictatorial rather than an intellectual exercise to improve the scientific basis for such priority setting. It was biased by equating species richness with significance, an equivalence not accepted in ecology. The process was not informed by the science of evolution or that of ecological processes, despite some effort to think how the latter might be done (*pers. obs.*). The whole issue of spatial and temporal variability was ignored. Terrestrial conservation ideas were used (species rarity, charismatic megafauna etc), even though these do not translate well to marine ecosystems.

According science such a central role, acknowledging science as the dominant form of knowledge, is one manifestation of cultural modernisation. But was this a deliberate political strategy of WWF or was it merely the extension of this western way of thinking? Mostly the latter I think, although there were indications that some WWF staff realised that perhaps it was not as scientific as it could be (for example, Goulder's comment that there were less scientists at the workshop than there had been at previous WWF ecoregion planning workshops held elsewhere). Yet, despite the lack of science and the

arbitrariness of the process, WWF facilitators repeatedly characterised the workshop's mapping as an expert process, being done by experts (*pers. obs.*).

WWF never acknowledged how social dynamics within groups, how a group perceived someone's authority, or merely a group's sympathy for a particular person's convictions all coloured the final result. Behind the whole workshop process were some vague ideas about its policy implications which the facilitators occasionally brought up as determinants of how a group should be doing things, such as where to draw lines in a matter under discussion—Bronwyn Goulder was concerned about 'boundaries for management'. (WWF-SP staff have subsequently pointed out how information collated into the FIME map could be used to set priorities in tuna management and tourism venture planning (Tabunakawai and Areki 2004 p. 2-4)). But these policy implications were never openly discussed and they confused people. The facilitators actively discouraged group discussions about the possible policy uses of the outputs, arguing that this was supposed to be a pure scientific evaluation. This is ironical given their process was one of science/policy (as I describe that in Chapter Three).

FIME as a reflection of orthodox global environmental policy discourse

FIME is clearly a policy process, designed to develop policy ideas and intended to influence other policy processes in the Fiji Islands. It is also part of a political assembly around the concept of a global ecological crisis, focused on the loss of global biodiversity. Moreover, FIME, along with other examples of WWF's ecoregion planning, is part of the process of cultural modernisation, the spread of western ways of thinking and behaviour throughout the non-western world. Ecoregion planning draws upon the technology of rational planning, specifying biodiversity goals then planning, in WWF offices in places like Suva, the means to achieve these. From these offices, WWF staff emerge to draw on their newly-created local constituency in a series of workshops.

FIME reflects the international discourse of global environmental policy. Both FIME, and WWF as its organiser, clearly see the Fiji marine environment as a problem to be solved. As a policy process, the strategic solution (ecoregion conservation) was decided before the problems are identified. The FIME process did not identify the threats to biodiversity before analysing ways to address those threats. Instead, it ranked biodiversity, on the presumption that the higher the rating the greater the need for conservation and protection. The FIME exercise was devised as an exercise in instrumental rationality ostensibly drawing on scientific criteria; virtually all attention was given to the means; the ends were poorly defined and justified.

FIME is also an exercise in international cooperation. In forming a vision for the biodiversity of the Fiji Islands marine ecosystems, WWF has not relied entirely on local knowledge or solicited only the opinions of Fiji Islanders. The Suva office drew from overseas offices the objectives and methodology of ecoregion planning and expert knowledge of the process. They brought in staff from those offices to run the workshop. And although the majority of participants were from the Fiji Islands, some represented overseas organisations (such as Coral Cay). There were also a few foreign scientists present. WWF thus drew some of the expert knowledge of Fijian places, ecosystems and species from overseas.

The FIME process aims to institutionalise a particular view of people's relationships with nature. WWF staff encouraged the participants to capture nature and turn it into a set of biodiversity priorities, existing separately of any connection with people. In placing the natural above the people, this reconfigured Fijian's sense of the *vanua* in which people are intimately connected with the land and sea (Chapter Eight). It codes people as threats, not an integral part of the landscape, shaping it and being shaped by it (Brosius 2004 p. 27). It treats the sea as something created in isolation from people, something needing to be saved from the degradation that peopled have caused in the last three thousand years. There is no sense of the co-evolution of people and nature. The FIME process, instead, viewed nature as something that can be ranked internationally, and as ripe for intervention. This is nature as written in the history of the modernisation of the western world: a series of resources available for human appropriation, degraded by modernisation and industrialisation, now being managed to control and avoid these adverse effects (Chapter Two). Nature is being rescued and managed by being enclosed into conservation territories, possibly some "fully protected" areas.

ECOREGION PLANNING AND CONSERVATION: CREATING A NEW POLITICS

The ecoregion planning efforts of large conservation organisations like WWF differ from previous approaches to conservation in being scaled-up both spatially and temporally. The policy technologies used in these exercises provide a way of legitimating, for some time to come, interventions by conservation practitioners over a large scale. In starting off with a base map of everything within Fiji's EEZ, WWF has represented the entire area as a potential conservation site, a place where conservation interventions may be carried out in future. Each ecoregion planning programme that WWF and other conservation NGOs conduct somewhere in the world enlarges the scale of pre-2000 environmental interventions. Each links information created at different scales into a single strategic blueprint for the future of a region. Collectively, the various ecoregion conservation exercises being carried out around the world will establish a comprehensive set of blueprints for the future of the planet.

Experience in the Fiji Islands supports Zimmerer's observation (2000 p. 358) that, while in developed countries the making of conservation territory has been typically generated through national planning, in developing countries it has been undertaken directly by aid agencies, international conservation agencies, NGOs and international agreements. These ecoregion planning exercises are doing more than just introducing technologies of cultural modernisation and changing the scale of environmental governance. They are creating a new form of governance—a new form of expert, professional authority with the right to 'save biodiversity'. The process legitimates the right of conservation practitioners such as WWF to work across political boundaries (such as *qoliqoli* and provincial boundaries), protecting biodiversity in these areas characterised as important. From proprietary databases and maps designed and constructed by a relatively small number of conservation practitioners, mostly in the US, a new system of governing developing regions is emerging (Brosius 2004 p. 29). Through its expert policy technology, the FIME workshop process enrolled local experts, many of whom are neither Fiji Islanders or locally-based, thus creating a new constituency. It created new group of experts (experts in Fiji's marine biodiversity and expert WWF facilitators), and structures of deference.

> [These ecoregions] imply non-state management of economic and ecological affairs without fully articulating the relationship between these new actors, local communities and the nation-state. As well, they leave a question-mark over exactly *who* has the power to determine action, and what the role of a denatured nation-state might be (Instone 2003, p. 10. emphasis in the original).

This ecoregion planning process is just beginning in the Fiji Islands. If, as Wolmer (2003 p. 6) suggests, the next step is for WWF to invite overseas agencies (e.g. bilateral and multilateral donors, philanthropic foundations, international NGOs and multinational companies) to invest in saving Fiji's marine biodiversity, and if the state cedes some authority and decision-making to these, then WWF would be introducing a new layer of accountability to the Fiji Islands. If these agencies choose to work with local communities, bypassing the state, then they introduce a direct line of accountability from Fijian community to overseas funder. One can guess at the implications but not know them for sure. The question of whether the map will gain credence in the Fiji Islands or merely in overseas NGOs deserves further (future) study.

Community Empowerment: Fiji Locally-Managed Marine Areas

THE COMMUNITY CONSERVATION PARADIGM

Ecoregion conservation represents a shift toward large-scale conservation. Before it appeared on the international conservation scene in the late 1990s, there had been an earlier shift in international NGOs' approach to conservation, seen in the Pacific Islands as elsewhere. That earlier shift represented a move away from formal protected areas that exclude local people, towards community conservation. In seeking to link the goals of conservation and effective resource management with the search for social justice for historically marginalised people, conservation NGOs diversified and ostensibly moved away from the traditional, top-down exclusionary approaches to protecting natural areas (Brosius *et al.* 1998, p. 158; Brown 2002 p. 6). Instead, they have re-imagined conservation—not as the preoccupation solely of state agencies and professional scientific organisations but as the business of communities. Since the 1980s, such bottom-up models of conservation have proliferated, claiming to incorporate the needs and priorities of local communities; as a consequence, community-based conservation and community-based natural resource management have become buzzwords.

This shift to community conservation mirrors the interest taken in the field of development to participatory approaches and community empowerment. The two fields of endeavour, development and international conservation, have moved towards each other, debates on biodiversity and development becoming enmeshed in wider discussions of globalisation. Both biodiversity and rural people's livelihoods are seen as being threatened by the process of globalisation (Brown 2002 p. 6).

In the South Pacific, the concept of community conservation areas made its appearance in the late 1980s (e.g. in SPREP's 1989 regional nature conservation strategy). While SPREP has supposedly not abandoned the pursuit of strictly protected areas, since 1990, virtually all that organisation's efforts at protected areas have been directed into establishing community conservation (Turnbull 2001). In the South Pacific, thinking on community conservation has taken a specific form—the renaissance of traditional management methods (Johannes 2002). In countries such as the Fiji Islands, where

indigenous communities had never renounced their right to certain coastal resources, this has had particular potency. In the regional agencies, SPREP in particular, and amongst the conservation NGOs operating in the region, there is a widespread recognition that coastal resource conservation and management programmes in the Pacific Islands can only succeed where the traditional owners are fully involved in all activities. The storylines of conservation and development have blended into a single of aspiration of conserving biodiversity and indigenous communities. The latter face significant challenges ranging from increasing embeddedness in capitalist society, with the consequent need for cash affecting resource extraction, to technological advances in harvesting that make it easier to harvest large quantities of resources in damaging ways and facilitate poaching.

THE NATURE OF FLMMA

WWF's work in the Fiji Islands embraces community conservation. In 2003, Fiji country programme staff were working at five project sites, including Tikina Waisomo on Ono mentioned above, and Tikina Malamalo on the Coral Coast where MAC and WWF are cooperating in addressing the effects of live rock harvest. (A tikina is an administrative unit comprising several villages). Since 2000, much of WWF's community conservation in the archipelago has been under the umbrella of FLMMA, a network WWF-Fiji helped establish. FLMMA has a dual aim: preserving natural biodiversity and providing alternative livelihoods for members of indigenous Fijian communities owning the right to fish Fiji's coastal areas (Veitayaki et al. 2003 p. 5). This reflects the marriage of conservation and development being attempted by WWF (Chapter Two). Through community-based schemes, FLMMA also aims to improve the number and skills of people effectively managing coastal resources (ibid).

Before FLMMA was created, the various agencies trying to establish community-managed marine protected areas in the Fiji Islands were largely working in isolation from each other. WWF joined other Suva-based agencies in creating the initiative: the Institute of Applied Sciences (IAS) at USP; Partners in Community Development, a Fijian NGO which is part of the Foundation for Peoples of the South Pacific network; IMA's Fiji office; and the Waitabu project, an initiative on a small community on the island of Taveuni originally funded by New Zealand's Agency for International Development (NZAID). The latter was subsequently sidelined by other participants (according to Helen Sykes, Resort Support, Suva, *pers. comm*), with WWF and IAS playing the key roles in designing and initiating FLMMA.

FLMMA uses a community-based approach to coastal conservation that builds upon traditional resource management practices. FLMMA members also provide coastal fishing communities with knowledge and training about the best ways to protect and conserve their fishing grounds for future generations, its trainers teaching villagers simple scientific monitoring techniques (Koroi 2003 p. 9; Veitayaki *et al.* 2003). When a community invites them to do so, FLMMA members facilitate village workshops, using participatory rural analysis techniques to identify issues and threats and a problem-tree approach to finding solutions. This culminates in a community preparing a management plan for specific coastal area, making decisions through consensus (as described in Chapter Nine). FLMMA members encourage communities to use their traditional methods, including setting aside *tabu* (no-fishing) areas; they teach them to monitor the recovery of stocks of resources they regularly harvest, such as the *Anadara* clam *kaikaso* (Veitayaki *et al.* 2003).

Officially launched in March 2001, FLMMA has gone from strength to strength, working with increasing numbers of communities. By January 2005, 29 coastal districts were in various stages of implementing management plans and a further nine were developing plans (Tavola 2005). The SDL Cabinet has endorsed its work. The Fisheries Division has become a member of the network, as have the thirty or so indigenous Fijian communities with which FLMMA members are working. Other Fiji Islands agencies that support FLMMA's work include further government departments and statutory agencies (Tourism, Fijian Affairs, Environment, National Trust for Fiji), groups associated with the tourism industry (Resort Support, the Coral Cay Conservation Society, Mamanuca Environment Association), further USP groups (the Women in Fisheries Network and Marine Studies Programme) and international groups with a presence in Suva (Wildlife Conservation Society, Wetlands International, and the US Peace Corps programme) (WWF South Pacific 2002a; 2002b; Tavola 2005).

The thinking behind FLMMA

In justifying their approach to community conservation, FLMMA members draw upon various narratives, as listed below. These excerpts from reports that FLMMA members have written about their work set out the thinking behind the network.

> There is a misconception among rural Fijians (perhaps related to subsistence affluence) that, since the environmental resources have provided for the people's sustenance in the past, they will continue to do so today. Many people have not understood the ecological strain and stress that marine resources have been subjected to and the fact that many of the natural resources are threatened because of overexploitation (Veitayaki 1998 p. 50).

> Local communities are the most knowledgeable about the changes taking place within their realm and how best to address resource management issues in their areas. Local people adjudicate on issues such as the use of their resources and their management. However, in recent times, local communities are facing escalating pressure to utilise their resources to enhance their economic activities as well as improve their living standards. Consequently people are lured by commercial cutthroats and advisers whose main aim is to acquire quick profit from the utilisation of the resources without any consideration of the associated environmental costs. Such liaison has led to the widespread degradation that is evident today throughout the Pacific Islands (Veitayaki *et al.* c.2002 p. 1).

> In many instances the local population is adversely affecting the sustainability of the resources. Much of it is not done out of ignorance but more out of economic pressure and necessity. Steps have been taken towards maintaining the sustainability of resources however this needs to be taken up more actively. If these threats are not adequately attended to, the combined effects of diminishing marine resource stocks, a steadily growing population and increasing concern relating to climate change will further exacerbate existing problems (WWF South Pacific (2003c p. 7) report of a survey at Malomalo).

> The villagers were fascinated by the interrelations within the ecosystems. The interchange between the mangroves and the reefs and the interdependence of organisms that are part of these ecosystems were unknown to villagers. This was the reason why the people were happy at the end of the workshop to declare a protected area that covers the mangroves, seagrass beds and adjacent reefs. People realised the protection of their fisheries resources required that these intricate interrelationships be understood (a workshop at Votua village, Ba described by Veitayaki *et al.* c.2002 p. 9).

There are many seemingly contradictory aspirations in FLMMA's work. Although FLMMA draws upon Fijian cultural attitudes towards consensus, conformity and traditional authority, it also seeks to empower ordinary members of Fijian communities to be able to speak up against chiefs that allow their resources to be over-exploited when they give approval to an 'excessive' number of fishing licences in exchange for goodwill payments (the system described in Chapter Nine) (Veitayaki 1998; Veitayaki speaking in FIME workshop, *pers. obs.*). Although FLMMA is a way for the owners of traditional fishing grounds and customary fishing rights to stop passively observing national government officials making most of the decisions about the management of their resources, and to participate more in selecting management tools, the NGOs involved hope that once operational, locally managed marine areas will become part of the government work programme (Veitayaki 1998 p. 51; Veitayaki *et al.* 2003 p. 19). Furthermore, they have consciously drawn Fisheries Division staff into the network's work and sought endorsement of the department's senior managers. Although FLMMA is a Fijian initiative designed to help Fijian communities better manage their marine resources, FLMMA is also part of an international learning portfolio designed to test conservation assumptions behind a portfolio of small-scale marine reserves in the Indo-Pacific (Parks and Salafsky 2001 p. 40). It has been influenced by American thinking about conservation. These seemingly contradictory perspectives reflect the diverse influences, aspirations, and motivations amongst the groups of people involved in FLMMA. They reflect the complexity of Fijian society, where the traditional meets the modern—FLMMA is a site where foreign narratives meet local ones and mingle.

Some of the storylines that FLMMA members are drawing upon are relatively recent, of foreign origin and associated with the business of conservation amongst the international community of conservation NGOs. These storylines include one about the value to conservation practitioners of being part of a learning portfolio and another about the value of measuring their success. For FLMMA has international links to several US NGOs, as the following history explains.

THE EVOLUTION OF LMMA AND ITS EXPERT POLICY TECHNOLOGIES

The history and growth of LMMA and FLMMA

FLMMA is part of the LMMA, a network formed of projects in the Indo-Pacific where conservation practitioners are working with local communities to implement and adapt traditional marine resource management systems, promoting conservation and resource security. LMMA has been set up as a learning portfolio, a network of projects sharing a common conservation strategy, and collaborating to increase their own effectiveness. LMMA projects are intended to investigate the conditions under which their conservation strategy does and does not work, and to improve the capacity of the members of the portfolio to manage projects adaptively (LMMA Network 2004).

This idea of international conservation projects combining to form a learning portfolio, collaborating across national boundaries, first gained prominence during the Biodiversity Support Programme (BSP), a large international programme which WWF, TNC, and WRI jointly ran from 1989 to 2001 with USAID funding (USD 85 million in total). Amongst the various BSP initiatives was the Biodiversity Conservation Network (BCN), established to test the idea that if local communities receive sufficient

benefits from an enterprise that depends on a healthy natural resource base, then they will act to counter internal and external threats to that biodiversity. BCN gave implementation grants to twenty community-based projects in seven Indo-Pacific countries between 1990 and 1999. Some of the US staff involved in developing the analytical framework for the BCN and in analysing its data, developed the concept further into the general notion of a learning portfolio for conservation practitioners working in developing countries: a special kind of programme that seeks to achieve specific conservation impacts and to systematically test a set of assumptions about the particular conservation strategies and tools being used (Parks and Salafsky 2001 p. 2).

These BCN staff wished to apply this approach to marine systems where adaptive management was being attempted (Nickerson *et al.* 2003). One of the BCN analysts, John Parks, moved to WRI where he co-ordinated a project titled *Fish for the Future*. Parks, with IAS' assistance, convened a workshop in Suva in August 2000, inviting representatives from five Pacific Islands to discuss a learning portfolio approach (Parks and Salafsky 2001). The *Fish for the Future* learning portfolio was intended to test conservation assumptions behind a portfolio of small-scale marine reserves in the Indo-Pacific, to systematically identify and document the specific conditions under which such reserves might be implemented effectively (Parks and Salafsky 2001 p. 40). IAS had some experience of this approach, having co-ordinated one of the BCN projects involving the Verata community north of Suva in bioprospecting. It was out of this WRI workshop that both LMMA and FLMMA were born. (The *Fish for the Future* project also targeted Indonesia, Philippines and Malaysia and a second workshop for participants from those countries was held a week after the Suva one (Parks and Salafsky 2001).)

During the 9th International Coral Reef Symposium in Bali in October 2000, most participants in these initial two workshops reassembled to formally launched the LMMA Network, which has since has evolved into a network of projects in several countries. The network links 'locally-managed marine areas' that, although they may vary widely in purpose, target, and configuration, share a commitment to fully engaging communities and local governments in all decision-making and implementation of their site management strategies. At Bali, LMMA members drafted a social contract, an agreement that governs how LMMA functions. The document, since refined, includes a vision statement, outlines what the members of the portfolio will do together, and describes the obligations and benefits of being a member (Nickerson *et al.* 2003). During 2001 LMMA participants developed, with the expert help of staff from the Foundations of Success (FoS) NGO (described below) a lengthy, detailed framework outlining how network members would collect and share information. Project representatives identified some of the conditions or factors they believed could influence the success of their projects. They also discussed ways in which they could measure project outcomes and progress. Project teams from Fiji and Indonesia tested and refined this during 2002; in 2003, it was translated into Fijian and Indonesian.

In the Fiji Islands, LMMA participants officially launched the learning portfolio in March 2002, at the WWF office in Suva, with representatives from IAS-USP; IMA, FSP, Tikina Verata, Ministry of Fisheries, and MSP signing the following agreement:

KEDRA SASALU TAWAMUDU NA NODA KAWAI

We as members of Fiji Locally-Managed Marine Areas (FLMMA) on this day of 15 March 2002, believe that by coming together under a shared framework of values, expectations, work and learning that as a group we will improve the practice of local resource management in Fiji.

INTRODUCING THE ACTORS: 15. FOUNDATIONS OF SUCCESS (FOS)

When BCN was wound up, two of those involved in analysing the BCN data, Nick Salafsky and Richard Margoluis, established this American-based NGO specifically to promote adaptive management and the use of learning portfolios in conservation projects. In 2004, there were five people on the FoS staff, including Salafsky and Margoluis. They fund their work through grants and consultancies. Despite their initial optimism that they would operate between five to eight learning portfolios at any one time, by 2004 FoS had only managed to establish LMMA (that being considered a single portfolio). FoS staff also work with other conservation organizations to help them develop adaptive management systems, facilitate cross-project and cross-site learning, and conduct monitoring and evaluation. FoS has spearheaded an effort to draw up professional standards for running conservation projects through the Conservation Measures Partnership, which they facilitated for conservation organisations including WWF, CI, TNC, and WCS.

Source: web sites http://FOSonline.org; www.conservationpractice.org/CCN/Mission.html

In 2003, LMMA participants began the process of periodically sharing information gathered from participating sites with one another and collectively learning from the pooled results. By 2004, there were more than 30 different LMMA project teams in eight countries across Southeast Asia, Melanesia, Micronesia, Polynesia, and Hawaii (LMMA Network 2004). By the end of 2004, LMMA had 4 full members including Veratavou in the Fiji Islands, the site which had started a monitoring programme when part of the BCN programme. Seven other Fiji sites had provisional membership, including the Ulunikoro marine reserve that WWF had helped establish on Ono Island and the Waitabu eco-tourism site established with NZAID support (The Locally-Managed Marine Area Network 2005 p. 12). In all 37 Fijian villages were participating, either as full or provisional members (The Locally-Managed Marine Area Network 2005 p. 13). Full and provisional members are those that have signed the LMMA network' 'social contract', also known as the network's *Agreement of our promises to each other*, which outlines how members will work together. Participants only become full members when have completed a site description, agreed upon a community-based management and monitoring plan, and are collecting data on a large majority (80-90 percent) of the 37 'Learning Framework factors' (The Locally-Managed Marine Area Network 2005 p. 10). Provisional members are those working towards this, and associate members are those interested in the function of LMMAs and community-driven resource management, but not necessarily participating in a site project (ibid).

The LMMA network also involves donors. The MacArthur and Packard Foundations have provided much of the network's funding, including the several hundred thousand dollars (US) spent each year on travel, workshops, training and (LMMA/FoS) coordination (Salafsky reported in School of Marine Affairs 2004). They also funded the first three workshops that WRI ran (Parks and Salafsky 2001 p. 1,3 and Bill Aalbersberg, IAS, USP, Suva, *pers. comm.*) Representatives of these donor foundations have participated in the LMMA network, attending regional meetings and the initial workshops at which the social contract was drafted and important decisions made on the network's direction. They were asked to subscribe to the same learning portfolio principles as other project members (Nickerson *et al.* 2003). They thus become associate members of the network.

LMMA operates through country network teams. FLMMA was the first country-level initiative to operate independently of the overall network and remains one of the most active teams within it (The Locally-Managed Marine Area Network 2005 p. 22). In 2004, FLMMA became an 'official' Fiji NGO—in the Fiji Islands all NGOs have to be registered as charitable trusts to be officially recognised by the government (The Locally-Managed Marine Area Network 2005 p. 23). Fiji also has the most project sites within the LMMA network (ibid).

The government has adopted FLMMA's approach, the Fisheries Division creating a new marine conservation division to work with FLMMA. The department is in the process of establishing '*Qoliqoli* management support teams', composed of departmental and provincial government workers, Peace Corps volunteers, community leaders and community members trained in LMMA techniques (The Locally-Managed Marine Area Network 2005 p. 18-19). Moreover, at the international meeting of small island developing states in Mauritius in January 2005 (BPoA+10), Fiji's Minister of Foreign Affairs and External Trade, Kaliopate Tavola, committed the Fiji Islands government to creating at least 30 percent of its oceans and coastal waters as marine protected areas by 2020, citing the FLMMA model (Pacific Island Broadcasting Association News Services 2005).

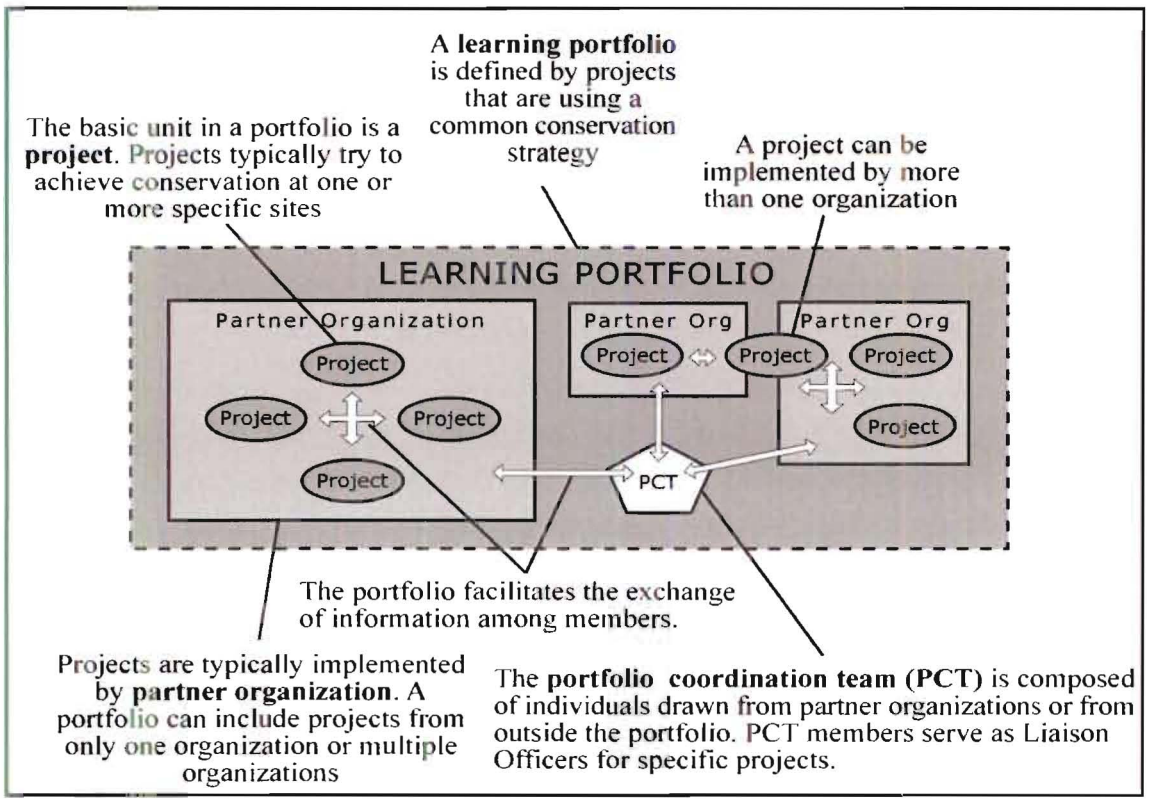
FLMMA has received international recognition. On SPREP's recommendation, ICRAN chose FLMMA as one of its demonstration sites (Veitayaki *et al.* 2003 p. 19). At WSSD in 2002, FLMMA won one of the six Equator Initiative Awards presented to community-based partnership initiatives aimed at promoting sustainable development (WWF South Pacific 2002a). In 2004, Alifereti Tawake of IAS won the annual WWF-sponsored Whitley Award for People and the Environment for his work with FLMMA.

LMMA's expert policy technologies

The learning portfolio is at the core of the LMMA network concept. Figure 6 shows FOS's idea of what a learning portfolio is. Although the learning portfolio approach derives from BCN, LMMA turned around the BCN idea that local communities were a threat to biodiversity, imagining them instead as those with the rights to manage and protect these. Rather than being formed around an explicit hypothesis as the BCN was, the LMMA network is intended to investigate the conditions under which marine protected areas will actually work in practice to help conserve dwindling marine resources (e.g. dependence on marine resources; standard of living; leadership; governance; human population density etcetera) (Nickerson *et al.* 2003). Underlying this is the presumption that, by

collecting an agreed-upon set of data, sharing stories and experiences, and promoting peer mentoring, members of the learning portfolio can improve and learn more efficiently (Nickerson *et al.* 2003). Participants are expected and assisted to publish monitoring results internationally in journals for conservation practitioners.

FIGURE 6: A LEARNING PORTFOLIO



Source: web site http://fosonline.org/WhatIsLP.cfm, accessed 15 June 2004

The learning portfolio approach enables portfolio members to access, at no cost, the support and resources from other LMMA participants (LMMA Network 2004). It both encourages international cooperation and provides a framework for managing it. In encouraging cooperation across national boundaries as the appropriate way of addressing common environmental problems, the learning portfolio approach is reflecting the discourse of global environmental policy, even through it uses different language from the examples discussed earlier.

The LMMA approach is based upon the idea of adaptive management and rational planning.

> If we have learned one thing...it is that our best chance to overturn our collective sad litany of failure [of overseas assistance] is to help local people and conservation practitioners use scientific principles to understand the situations at sites where they are working. With this knowledge they can then design the appropriate actions and monitor the impacts of these actions so they can adapt and learn over time (Salafsky and Margoluis 2000 p. 55).

Another expert policy technology upon which the LMMA network draws is that of measuring conservation success, a technology which FoS and the Conservation Measures Partnership have been developing (see text box on p. 255). This concept applies to conservation projects, a development project management mentality, that of adaptive project management. In the USA, FoS has been instrumental in pushing this idea in the arena of international conservation policy, arguing:

> ... we have become convinced that conservation will only succeed if we can help practitioners define conservation and objectively measure their success in moving toward it...[if they use] use adaptive management to make their own maps of the landscape and capture the knowledge they have gained in learning institutions (Salafsky *et al.* 1999).

The expert policy technology of measuring conservation success carries the instrumental, technocratic approach to environmental management to its extreme—all attention on the means and little thought given to alternative ends. It moves the goalposts from nature (environmental quality) to learning and sidesteps any intellectual debate about the politics, ethics, justice or even the utility of the knowledge being acquired. It creates a type of truth regime; if something has been labelled a success, as FoS and others have labelled LMMA, one tends not to question whether it is.

For LMMA, the Learning Framework factors to be measured cover the 'target' (species, habitat and ecosystem health), direct and indirect threats, and details of the project and the tools being used (the Locally-Managed Marine Area Network 2004 p. 4.2-4.4). Unlike ecological surveys which concentrate on ecosystems, species, and habitat, most of these Learning Framework factors concentrate instead on perceived threats (ibid). This data has not been incorporated into the GCRMN global status reports and little has (yet) been published, only that derived from the BCN-initiated study at Verata.

SOCIAL TECHNOLOGIES: WHO IS CO-OPTING WHOM?

The way that LMMA rests upon these expert policy technologies suggests that various Indo-Pacific project teams, communities and sites are being co-opted into particular socio-ecological technologies that originate in western countries and draw upon orthodox global environmental policy discourse. Certainly this is an interpretation favoured by the history of LMMA, but it is not the only interpretation as this section explores.

Foreign experts

On one hand, the history of LMMA suggests that a very small group of Americans, connected through the BCN project, established LMMA as a means of furthering their own professional interests. For example, John Parks instigated LMMA when he moved to WRI and managed the *Fish for the Future* project. When that project finished and Parks moved onto another NGO in Hawaii, FoS staff claimed the LMMA network as their own even though they had not been formally involved in establishing it. (Nick Salafsky, who founded FoS, had edited the WRI report on the initiation of the learning portfolio). Former BCN director Bernd Cordes helped facilitate WRI's Suva workshop as a representative of the David and Lucile Packard Foundation (Nickerson *et al.* 2003). Ex-BCN employee, Michael Guilbeaux had attended the Suva WRI workshop as a representative of Community Conservation Network, another small US-based NGO that Guilbeaux had set up with John Parks and two others. Guilbeaux

went onto become the first coordinator of the LMMA network. Like Salafsky and Margoluis, Guilbeaux and Parks had created an NGO as a means of carrying on work begun in BCN. This small group of American men have combined the practice of establishing small American-registered NGOs with expert policy technologies, forming a vehicle for forging careers in international conservation.

Although LMMA members publicise their work at meetings such as the 10th ICRS; selling it as a novel and successful approach to conservation in developing countries, its expert policy technologies are by no means novel. Only the close networking on a relatively large scale is a little unusual and that occurs because of the considerable money the donors provide for travel. Rather, LMMA draws on ideas and technologies common in other disciplines. The idea of a social contract is an ancient one, introduced into political theory by Plato and taken over by Locke (Scruton 1996 p. 511). The idea gained prominence in American science in 1997, when the president of the American Association for the Advancement of Science, Jane Lubchenco, spoke of the need to form a social contract amongst scientists who are committed to helping society move towards a more sustainable future in the new 'century of the environment' (Stauth 1997). The practice of measuring success is common in international development aid, with its use of 'log frames'. (A log frame ("logical framework") is a tool for project planning and management widely used by development agencies such as the World Bank; developed in the 1970s, it combines ideas from strategic planning with the 'management by objectives' models found in management.) The concept of adaptive management also has several decades of history in the US, being developed by C.S. Holling and colleagues at the University of British Columbia's Institute of Resource Ecology in the late 1960s. Holling introduced the concept into scientific literature in 1978, in his book *Adaptive Environmental Assessment and Management.* This same concept underlies the shift in emphasis towards nonequilibrium theory in ecology and towards strategies of encouraging reef resilience described in Chapter Eight.

Local experts

On the other hand, the LMMA network has created the opportunity for those Pacific Islanders who are involved to meet individuals from other projects, to exchange stories, and learn directly from them (Nickerson *et al.* 2003). In meeting other LMMA meetings, and in attending internal summits such as WSSD, indigenous advocates such as Tawake and Veitayaki can find common ground outside national borders (cf. Brosius *et al.* 1998 p. 6). Being part of LMMA has meant having access to funds for international travel. It offered opportunities for international recognition. LMMA network members work hard at promoting themselves and their work, using donor funds to aid this; they nominated part of their own network (ie FLMMA) for the Equator Initiative Award, the two nominees being Nick Salafsky (of FoS and LMMA) and Bill Aalbersberg (director of IAS, USP and a member of FLMMA). LMMA has also created the opportunity for IAS to establish itself as a leader in community conservation training. Furthermore, the network has provided a brand that IAS can employ to bid for funds from the Macarthur and Packard Foundations, enabling the institute to create itself as a regional leader in community-based conservation.

The professional aspirations of these ex-BCN men have coincided with those of a group of people at USP and thus shaped FLMMA. The two groups were able to cooperate in a single programme because

FLMMA's diverse linkages and nature were sufficient to satisfy multiple objectives. Those objectives included aspirations to be professional conservation practitioners, achievable if they sell their efforts as being novel and successful, and if they continue to attract the donor funding needed for travel.

The Fiji government

The SDL government's adoption of FLMMA as a way of supporting Fijian communities' *qoliqoli* management and channelling 'livelihood support' suggests that it may, itself, be co-opting LMMA into the project of maintaining its electoral base in those indigenous communities (Chapter Nine discussed these electoral exigencies). At the Mauritius meeting in 2005, Fiji's Minister of Foreign Affairs and External Trade announced:

> The Government of Fiji declares its commitment to initiating the consolidation of its national networks of marine protected areas, or Waitui Tabu, as the mainstay for national incomes, coastal livelihoods and traditional cultures, hand in hand with the provision of alternative sources of livelihood. This is to replace those sources of livelihood that may be lost because of complete protection of sections of marine areas. Although I note that in some parts of the world, such lost income has proven only temporary, as once MPAs are established and fish and other living resources are able to produce new generations that disperse to non protected areas, catches and incomes of local people actually can increase. Further, by 2020, at least 30% of Fiji's inshore and offshore marine areas, (*I qoliqoli*) will have come under a comprehensive, ecologically, representative networks of MPAs, which are effectively managed and financed. This will contribute to the South Pacific regional system and to the global target of 10% of world seas being managed under MPA by 2020. This global target is articulated under the WSSD Johannesburg Plan of Action (JPOA) and the Convention on Biological Diversity (CBD), both of which Fiji is a signatory to (Tavola 2005).

In effect, the SDL government is using community conservation, and FLMMA in particular, to support its decision to formally recognise Fijian ownership of traditional fishing areas. Moreover, in adopting FLMMA, the government can now employ it as a means of channelling overseas funds to those communities—it is seeking GEF funds for this purpose (The Locally-Managed Marine Area Network 2005).

LMMA as a technology of modernisation

There is, however, another insight into the question of who is co-opting whom which should not be overlooked. LMMA is rooted in the discourse of global environmental policy, as I show here, suggesting a certain distancing from the traditional management which FLMMA claims to be reviving through its use of methods such as *tabu*. LMMA's assumption that its research is divorced from any human attitudes or values about reality is positivist—attitudes and values are not accorded any part in revealing the cause and effect relationships which make up reality. This positivist approach echoes the instrumentally rational character of the orthodox discourse of global environmental policy. In the conceptualisation of the LMMA programme, the positivist character of BCN's approach to testing hypotheses has been toned down; there is less emphasis on ascertaining cause and effect relationships underlying reality and more on adaptive learning and sharing experiences.

LMMA's work reflects the instrumentally rational character of the orthodox version of the discourse in the way it is bringing rational planning to the Fiji Islands and its other developing country members. This deliberate process of cultural modernisation is occurring at two sites. One is within the circle of professional practitioners: the self-learning within the learning portfolio, the LMMA approach and its adaptive management approach, and the measuring of conservation success. The other is the cultural modernisation LMMA facilitators bring to local communities by teaching them to identify problems and plan how to solve them. FLMMA facilitators are introducing rational planning to indigenous Fijian communities, also notions of cause and effect and the idea that communities can do something about the stocks of their resources. The facilitators are teaching basic monitoring techniques and encouraging the use of *tabu* areas. FLMMA's community projects are both training projects and planning projects, and a way of constructing (common sense) policy. WWF and other FLMMA facilitators such as IAS are thus disseminating hegemonic commonsense to Fijian communities. They act as gatekeepers of knowledge, selectively imparting a little scientific information to the Fijian communities with which they work (Wana Savoy, Partners in Community Development Fiji, Suva, *pers. comm.*). Their work is giving rise to new subjectivities, their own recreation as local LMMA experts, the eco-rational Fijian community, and the LMMA itself—the rationally-managed eco-area.

FLMMA's work represents the intersection of three disparate storylines. Two of those—the environment as a problem to be solved through rational planning and scientific methods and science as the property of experts yet a tool able to be taught to communities—are part of the orthodox version of the discourse. The other storyline is the right of communities to manage their own resources. FLMMA employs the orthodox version of the global environmental policy discourse in conjunction with a political discourse about indigenous rights to coastal resources. FLMMA members are creating an image of themselves as a new type of expert at the intersection of those discourses, able to bridge the gap between the world of international conservation and that of the Fijian village.

FLMMA actively works to support the political system operating in the Fiji Islands, particularly the aspirations of communities to adequately manage their resources by themselves and the efforts of SDL government to establish this in national law as a right. There are elements of political modernisation incorporated into FLMMA's work. FLMMA practitioners encourage people to stand up to their chiefs; they encourage women and youths to talk amongst themselves, segregating them during group discussions so they can share their views. In this, FLMMA is only a little radical since FLMMA members still draw heavily upon the cultural and political practice of consensus that operates in indigenous communities (described in Chapter Five). Although they attempt to give a voice within the community to youth and women, this is not a wholesale attempt to change the power relations that exist within Fijian communities or the distribution of the costs and benefits of conservation (cf. Zimmerer 2000 p. 359). It is, in effect, paying lip service to political modernisation, because it is at the same time, attempting to retain the culture of Fijian communities. This reflects the FoS' approach: in concentrating on measuring conservation success, Salafsky, Margoluis and their collaborators avoid the ethical dilemmas confronting researchers and development workers in overseas locations as Wismer (2000) observed in her review of their book *Measures of Success,* a book which describes how to measure such success in Third World conservation projects such as FLMMA (which it predates).

In bringing cultural modernisation but little political modernisation to Fijian communities, there is a paradox for FLMMA members employed in NGOs such as WWF. As MacDonald (c.2003) pointed out, if conservation organisations like WWF (and now FLMMA itself as an NGO) are to understand the source of their own power through reflections on their own ideological bases and on the ramifications of their actions and practices, then they must generate an institutional culture in which free debate and dissent are the norm. They must encourage introspection, and respect and value tolerance for difference over conformity. In this, there is no place for an organisational culture of management by consensus. WWF, in supporting a culture of consensus within Fijian communities, is in a paradoxical situation. Should it encourage dissent and free-thinking or merely try to institutionalise standardised thinking in line with imported expert policy technologies such as ecoregion planning and adaptive management concepts? These two case studies suggest that, at present, the latter strategy is dominant.

FLMMA members legitimise their efforts by asserting they are authentic local efforts at conservation, yet these are efforts that draw heavily on expert policy technologies of western origin, with a positivist approach redolent of Enlightenment thinking. In this, FLMMA is not all that it claims to be. Yet, it is in other ways, more than it seems, not just an indigenous Fijian initiative but a way of shaping the global *sensu* Massey, being a location at which disparate trajectories connect, part of global space comprised of many locals. Wherever LMMA members meet and communicate, negotiating differences and inventing new forms of collaboration, there is the potential for novelty, transforming the field of international environmental management *sensu* Bourdieu. But there are two constraints on this. One is the culture of consensus; the other is the modernist discourse of global environmental policy.

Discussion

FIME AND FLMMA: A COMPARISON

WWF has invested in both FIME and FLMMA and several WWF (and USP) staff are involved in both projects. Rather than being planned as part of a grand strategy to tackle marine conservation in the Fiji Islands, FIME and FLMMA appear to have developed separately, coinciding in time. FLMMA grew out of WRI's approach, which had grown out of the BCN in which WWF had been involved. FIME evolved separately out of WWF's international efforts to institutionalise ecoregion conservation. These two projects happened to coincide in the Fiji Islands and evolved alongside each other. The result of this coincidence of projects is that WWF does not appear to be particularly discriminatory in the expert policy technologies it draws upon in the Fiji Islands.

FIME and FLMMA have different policy targets. FLMMA's work is centred on communities. FIME is largely bypassing communities, according them a token presence only. In both projects, the Fijian state is just one of several players—most of the contact occurs with a few individuals in the Fisheries and Tourism departments. Yet both WWF and IAS are endeavouring to use FLMMA to reshape state policy. Two IAS and two WWF members wrote a paper seeking cabinet endorsement for FLMMA, which the Fisheries Division management submitted in their department's name (Dermott O'Gorman, former head of WWF-SP Programme Suva, *pers. comm.*).

FLMMA's Nature is the nature of Fijian villagers, while FIME is concerned with Nature as seen and interpreted by experts. In FLMMA's work, conservation is about the species Fijians eat, and only that. This is conservation of village food not conservation of an ecosystems and ecoregions to which FIME aspires. Yet both FIME and FLMMA approach the environment as a problem to be solved—Nature in need of rescue. Rather than the projects being justified by the coral reef crisis narrative, each draw upon other narratives of degradation and crisis. FLMMA focuses on problems such as declines in the stocks of fish and shellfish used for food, and on local pollution. FIME focuses on biodiversity loss and on habitat loss generally. Both are part of global political assemblies around an ecological crisis but with subtle differences.

In FIME, because people do not appear on the maps, the ecoregion planning technology serves to distance 'bioplanners' from the effects of their interventions and their responsibilities to people. People are just threats lurking in the background, justifying the urgency of the work. In FLMMA, people are put back into environment.

Both FIME and FLMMA accord a central role to experts and both projects train local experts in policy technologies imported from overseas. Both create new types of experts. FIME is creating experts in Fiji's marine biodiversity and in visioning processes with the authority to save that biodiversity. FLMMA is creating experts able to bridge the gap between international conservation and the realities of life in a Fijian community, to marry these into syncretised conservation practices and to communicate these to the international community of environment and development experts.

Although FIME and FLMMA may seem very different expert approaches, the policy technologies upon which they draw share a culture of modernisation. They share an unscientific optimism about the possibilities for comprehensive planning and conservation intervention, carried out as projects, to solve the problems of environmental degradation; this optimism borrows the legitimacy of science and technology. They seek to address environmental degradation in Third World communities which have never been industrialised and in which modernisation is a very slight and partial project: professional conservationists are the agents of modernity in the Pacific. The FIME and FLMMA projects share another common feature: each involves expert participants learning as they proceed, working out what to do next, drawing on experiences and storylines from elsewhere.

WHERE IS THE HEGEMONY IN THIS?

The professionalisation of international conservation

The FIME and FLMMA projects are part of efforts to establish a profession of international environmentalism, an expert system of technical accomplishment with concomitant authority, prestige and social standing. In the Fiji Islands, the environment is being remade as a site requiring specialist knowledge. Conservation is being professionalised and charged with rescuing nature.

In the Pacific, international conservation NGOs are drawing upon practices of science and instrumental rationality as a professional resource. They are using expert policy technologies to consolidate their authority over global conservation. In designing and employing specific technologies, they recreate themselves as methodological gatekeepers and establish their terms of participation in international

conservation (Chapter Three). The expert policy technologies being employed in this manner include those described in this chapter—ecoregion conservation, learning portfolios, measuring conservation success—also community conservation through PRA techniques and MAC's commercial certification.

Modes of power

This is neo-Gramscian hegemony through the professionalisation of international conservation as a field of endeavour conducted in developing countries by NGOs. It entails a hegemony of western ideas about conservation being exercised through various modes of power: for local NGO employees, the inducement of employment, professional status and travel; for villagers, the authority and seduction of the expert and the inducement of perks provided by funding; the people from village or tikina acting as primary liaison with NGOs, and for the governmental department staff undertaking this role, the status and travel. These are part of a suite of modes of power being exercised in the policy practices of WWF and other international NGOs working in the Fiji Islands. This chapter has portrayed the seduction of being invited to participate in planning processes as an expert: whether in FIME's visioning workshop or in LMMA's development of a learning portfolio, social contract, and participatory methods for 'working with' Fijian communities. Ambitious local actors, allured by the opportunity for professional recognition, travel, external funding and other forms of recognition will appropriate abstract modes of discourse in order to gain access to these; this illustrates the power of seduction.

Other modes of power are evident. Both the FIME workshop and the LMMA scheme echo Arendt's notion of associational power, people acting together for a common purpose (discussed in Allen 1999 p. 208-211). But other modes of power are also being exercised in both schemes. During the FIME workshop, persuasion and manipulation were also very much to the fore (as described). Yet WWF never acknowledged how this exercise of power contributed to the result. They, instead, presented it as an expert, consultative process, black-boxing what WWF staff were required to do to shape the result towards achieving the sort of result they sought. This is part of the hegemony of expert policy technologies used in developing countries such as the Fiji Islands.

The Fiji government provides another example of power. It has appropriated the FLMMA scheme to address its own political exigencies at the same time as it portrays itself, on the world stage, as committed to marine conservation. In doing so, it is manipulating conservation paradigm to suit its own particular political needs and its desire for international recognition.

CONCLUSION

This chapter has highlighted the role that the professionalisation of conservation plays in shaping the field of international environmental policy. The self-interest that professionalisation fosters at both organisation and individual scales is a significant factor in the political assembly being built in the Fiji Islands around a crisis in biodiversity conservation. Here, again, is nature in need of rescue—the environment as a problem to be solved—and rational planning and science as the provider of solutions under the guidance of experts. Here too are further local efforts to co-opt the discourse of global environmental politics to local ends, both that of an emerging cadre of environmental professionals and of the SDL government.

As well as showing how the Government of Fiji (GoF) is using the technologies of marine conservation to maintain electoral support, and how ambitious local actors are appropriating abstract modes of discourse in order to gain access to material resources and status, the chapter has demonstrated the converse—how global actors from the outside attempt to evoke local frameworks and reference-points for purposes of scientific, political and commercial infiltration. Through such dialectical instrumentalities, local and global language continuously intermingle and shade into one another (Hornborg 1994 p. 260). This leads to a central notion of modernity: the adoption of a decontextualised discourse that is itself a distancing from place and culture. Through the expert policy technologies being employed by conservation NGOs, the discourse of global environmental policy is, effect, distancing local policy from the local, something that Chapter Thirteen explores further.

Chapter Twelve

Trade in Coral Reef Organisms

Introduction

The two previous chapters have highlighted the role of experts, examining how a politics is built through, on the one hand, the expert technical practices associated with assessing the state of coral reefs and with conservation and, on the other hand, experts pursuing professional advantage. This chapter continues that focus, examining expert policy practice concerned with the environmental effects of trade in coral reef organisms. This brings the study back to the suggestion, in Chapter Seven, that a bloc comprised of the US, Canada and other industrialised countries which import significant quantities of these organisms is seeking to control the environmental terms on which this trade is conducted. The chapter focuses on three policy designs aimed at controlling these environmental terms: (1) CITES' involvement with the Fiji government over coral exports; (2) MAC's neoliberal certification scheme for the marine ornamentals trade; and (3) collaborative efforts to address the live reef food fish trade in the Pacific region. Although each of these three schemes operates within the outwardly cooperative framework of global environmental governance and policy, each is an inherently political enterprise in the sense of being power-filled. In examining tensions amongst the groups involved in these efforts, and the modes of power being exercised, I allow these ventures to be seen in ways other than that suggested by normative explanations with moralistic overtones found in the global environmental policy discourse. This permits their hegemonic nature to be seen, adding to the evidence for First World hegemonic control in matters of international environmental policy.

METHODOLOGY: INVESTIGATING CITES, MAC AND THE LRFFT INITIATIVES

In the sense that the three examples examined in this chapter are the main efforts over the last five years to tackle the environmental problems associated with the exports of reef organisms from the Fiji Islands, they self-selected. I used several methods to research these: interviews, web and library searches for primary material (all CITES notices, minutes and reports are on their web site, for instance), and participant-observation at workshops in Suva (a Fiji one run by MAC, and a regional one on the live reef food fish trade run by SPC with USP's help). At those workshops, I was able to observe and gently test through questions and comments, the political agendas of overseas participants and those from Pacific regional intergovernmental agencies; in the same manner I was able to examine the extent of local participants' understanding of those agendas.

Exports of Reef Organisms: Diverse Policy Approaches

CITES AND REGULATION OF CORAL EXPORTS

Controlling the environmental impacts of Fiji's coral trade: CITES' role

Fiji's export trade in corals has attracted the attention of both CITES and several international NGOs concerned with the marine ornamentals trade: MAC, WWF-SP, IMA, and TRAFFIC (the latter introduced in the text box on the next page). In this section I look at the Fiji government's involvement with CITES and TRAFFIC in regard to trade in corals only, and in the next section at its involvement with MAC regarding the marine ornamentals trade generally (not just corals).

I examine the CITES example in some detail because that organisation has had the most significant impact on government's policy for the coral trade and because it illustrates clearly the exercise of coercive power within the overall cooperative framework of international environmental governance. Furthermore, the way that CITES dealt with the Fiji government suggests that accuracy about the scale of exports is not of paramount importance in determining CITES approach to (some) member countries. In justifying its heavy-handed stance in persuading the Fiji government to conform to the convention, CITES staff used inaccurate figures about recent increases in the scale of Fiji's export trade. Yet even when more accurate statistics were compiled retrospectively and it was apparent that the trade in corals was smaller than thought, at no time did CITES staff apologise for their heavy-handedness or change their approach. Instead, they further justified their approach in the name of capacity-building. This example is also interesting because it illustrates how tensions within the Fiji government shaped the way in which departments cooperated with CITES.

INTRODUCING THE ACTORS: 16. THE TRAFFIC NETWORK

TRAFFIC is an international non-governmental organisation monitoring wildlife trade, endeavouring to ensure this trade is not a threat to the conservation of nature. The IUCN Species Survival Commission established TRAFFIC in 1976, primarily to assist in implementing CITES. In 1999 TRAFFIC also took on the role of capacity-building on behalf of CITES, a relationship formalised through a memorandum of understanding. TRAFFIC's philosophy is that sustainable trade in wildlife that is conducted legally and based upon best available science can benefit local communities and national economies. A joint programme of WWF and the IUCN, the TRAFFIC network is governed by a committee of eight, four nominated by WWF and four by IUCN. Its head office is in Cambridge, UK and it has 32 offices, eight of which are regional, including an Oceania office in New South Wales, Australia. In early 2003, TRAFFIC appointed a representative to Suva, reporting to the Oceania regional office.

Source: TRAFFIC (2003); Rob Parry Jones (TRAFFIC, Suva *pers. comm.*.)

The Fiji government's control of coral exports

In any examination of the approach that CITES staff took in dealing with the Fiji Government's coral trade, it is important to be clear that, although Rabuka's Soqosoqo Vakavulewa ni Taukei (SVT) government was slow in meeting the obligations it took on when it signed the CITES in 1997, it did have some controls in place to manage coral harvesting and exporting. Since the trade commenced in 1984, coral exporters have been licensed by government and subject to Cabinet guidelines (Viala 1988 p. 3). Subsequent governments have endeavoured to address domestic disagreements about the trade's environmental impacts, thus belying any notion that they were totally irresponsible. The Cabinet guidelines prohibit the use of scuba gear for collecting corals. They require consultation between the collector and Fisheries Division to determine management requirements for particular areas, prohibit harvesting in tourist areas, and specify that indigenous custodians of the reefs be involved in harvesting as much as possible. The guidelines also specify the need for permits to export marine products (Malakai Tuiloa, Fiji Fisheries Division, Suva *pers. comm.*. at MAC workshop 2002).

After signing CITES, the Fiji government continued its previous system of managing the coral trade, although it delegated the Department of Environment the job of monitoring the environmental status of the resources. This system entailed the Fisheries Division issuing permits to exporting companies under section 64 of the Customs Act 1986 in an *ad hoc* arrangement with the Customs Department, something it had no legal powers to do but which the local industry had not challenged legally (Lovell 2001 p. 36). Those wanting to export coral applied to the Fisheries Division for an export permit stating the numbers or the amounts of material they anticipated exporting (Lovell and Tumuri 1999 p. 46). In granting permits, the Fisheries Division was in the practice of stipulating this amount as a maximum permissible to be exported each year. Although the Division had not attempted to assess natural stocks in order to establish sustainable levels of harvest, it had a departmental policy that included provision

for a baseline survey before coral collection commenced in a new area, with occasional follow-up surveys (Richards *et al.* 1994 p. 105).

The system operated unchallenged until early 1999, when as result of USCRTF investigations into the coral trade (preparatory work for the national action plan to conserve coral reefs, discussed in Chapter Seven), it appeared that the US might close the trade down. Fisheries Division commissioned local biological consultant Ed Lovell to investigate the environmental impact of coral harvesting in conjunction with a Fisheries staff member. The report, an investigation of industry practices compiled with the assistance of exporters (Lovell and Tumuri 1999) was completed mid-year, around the time a Labour government was elected, replacing the SVT government. The report made numerous recommendations about how the Fisheries Division could better manage the industry, including better data collection, forming best practice guidelines, legislative amendments, and requiring the certification of all collectors and exporters.

Cognisant of complaints from the tourism industry, the new Minister for Environment Ganesh Chand publicly suggested that the coral and marine ornamentals industry should be closed, reportedly putting this in a memo to Cabinet (Ken MacKay, C-SPODP coordinator, Suva, *pers. comm.* November 2003). A Cabinet sub-committee looking at the industry subsequently announced that it was considering a total ban and revocation of licences because there was no effective monitoring of the trade (PacNews 1999). Although the Labour Government sought public submissions, its public inquiry lapsed when it was ousted in a civilian coup in May 2000. After the coup, the Fisheries Division continued to manage coral exports as before. But concerns about the trade's impact on reef ecology, raised by the Fiji Hotels Association, Fiji Dive operators, the Ministry of Tourism and some provincial councils, prompted the Department of Environment to take a more active interest. So too did the interest that CITES had begun to take in the country's exports, an interest spurred in part by the two reports on the international coral trade. In both the Green and Shirley (WCMC) report and that of the USCRFT (reports introduced in Chapter Five and discussed in Chapter Eight), the Fiji Islands was cited as one of the countries whose trade should be of concern because of its size and rapid expansion since 1994 (Green and Shirley 1999 p. 13-15; Trade subgroup of the United States Coral Reef Task Force 2000 p. 25 footnote). "The most dramatic increase in [international] trade since the mid 1980s occurred in Fiji which exported an average of 27t per year between 1990-1994. In the mid 1990s this increased by an order of magnitude to an average of 293t between 1995 and 1997" (Green and Shirley 1999 p. 15).

The Government and CITES

In 1999, CITES Secretariat staff identified parties to the convention that were engaged in significant amounts of international trade in coral specimens of CITES species, yet whose national legislation did not meet the requirements for implementing CITES. They identified the Fiji Islands as one such party, using the export figures on the size of the trade published by Green and Shirley (1999). When the Secretariat brought this list to the attention of its CoP the same year, the latter decided (Decision 11.16) that if those parties did not adopt suitable legislation before the end of October 2001, then all CITES' parties should refuse to accept exports of CITES-listed species from the offending countries (Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora

2003b). The CoP delegated to the CITES Standing Committee the authority to decide appropriate measures to bring these transgressors into compliance with the convention (Decision 11.17) (Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora 2003b).

The convention covers all species of hard corals (Chapter Six), so when the Fiji Islands acceded to it in 1997, it was making a commitment to ensuring its coral trade was sustainable. Parties to CITES are required to issue a permit for any coral export, proving the specimen has been legally obtained and that the export is not detrimental to the species' survival. This is a two-way process. Before accepting imports, including any carried by tourists, countries party to CITES require export permits from the country of origin (UNEP Coral Reef Unit and WWF Coral Reefs Advisory Initiative 2003 p. 6). Furthermore, under European Council regulations, imports into the European Union require documentation of the CITES 'non-detriment' finding, (i.e. that the export is not detrimental to the survival of the species in question), documentation additional to that required under CITES' provisions (FMACC 2003b).

In 1999, there were two shortfalls in the Fiji government's compliance with CITES. It had failed to provide annual reports (which allow the Secretariat to analyse international trade). It should also have set up an official authority to manage the trade as well as a scientific authority to ensure it was sustainable (it had established neither). Following the CoP's decision in 1999, the Secretariat brought these matters to the attention of Fiji's Department of Environment, the *de facto* management authority. In April 2000, the Secretariat officially notified the Department that the Fiji Islands might be subject to a recommendation to suspend its coral trade (Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora 2003b). At this stage, the Department had been aware for at least a year of CITES' concern over Fiji's trade, a year during which a Labour government had been elected and threatened to close the industry down. When the Labour government was ousted in a coup in May 2000, the CITES Secretariat waited six months before writing to the Department of Environment to remind it of its obligations and to impose a deadline of 31 October 2001 for legislation to be passed (Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora 2001b; Department of Environment Fiji 2002 p. 4). Over the next three years, CITES officials and representatives put considerable pressure upon the Fiji Government, twice suspending all trade in corals from the Fiji Islands. As a result the SDL Government passed *The Endangered and Protected Species Act 2002* and the *Endangered and Protected Species Regulations (2003)*, and set annual quotas for each species and for live rock. It established both a CITES management authority and a scientific authority. Throughout this period, CITES (particularly its secretariat staff) adopted an increasingly heavy-handed and coercive approach to the Department of Environment with whom it was dealing. Times between receiving information and seeking further information became shorter and shorter—down to a matter of only a day in one case. This heavy-handed attitude is interesting when viewed in relation to the inaccuracies and doubt over the actual scale of Fiji coral exports—remembering that CITES took an interest in the Fiji Islands ostensibly because it had significant coral exports. I document this chronology in Table 20 following.

TABLE 20: CHRONOLOGY OF CITES' APPROACH TO THE GOVERNMENT OF THE FIJI ISLANDS

Fiji Government response to preceding CITES' action	Date	Action subsequently taken by CITES	Timing of CITES' response
—	27 Nov. 2000	CITES write imposing a deadline of 31 October 2001 for CITES legislation to be passed	—
GoF replied they were making progress; subsequently missed deadline due to need for further consultation on the bill intended to contain CITES legislation	January 2002	The Secretariat suspended all trade with Fiji in CITES-listed species (Notification 2002/003)	Suspension put in place 23 January 2002, three months after the deadline had passed.
Making excuses, including the effect of the 2000 coup, a GoF representative at the 46th meeting of the CITES Standing Committee sought to have the suspension lifted	Mid-March 2002	Standing Committee temporarily lifted the suspension in response to GoF agreement to enact national legislation before year-end and to follow an agreed plan which included setting quotas for coral species at 50 percent of previous year's exports	Decision taken at the same standing committee meeting—deadline for legislation extended to 31 December 2002
Supplied a table showing a 'Voluntary coral quota 2002', based on a 50 percent reduction from 2001 figures	18 July 2002	Requested copies of 2001 and 2002 permits to verify quotas. Advised that because GoF had not submitted 1997-2002 annual reports, Fiji remained potentially subject to recommendation to suspend trade	5 August 2002
Requested a 6-month extension of the deadline to enact legislation but provided information enabling the secretariat to verify action plan was being followed	November and December 2002	Secretariat informs parties that the recommendation to suspend trade is temporarily withdrawn (i.e. trade continues)	Later the same month
Advised CITES that the Fiji Parliament had enacted *The Endangered and Protected Species Act 2002* on 6 December 2002	December 2002	Advised Parties that they should not accept export permits for CITES-listed coral specimens from Fiji until the Secretariat verified 2003 quotas	7 February 2003
Submitted its 2003 coral export quotas to the Secretariat	April 2003	Sought clarification regarding the process of legislation coming into force and development of implementing regulations. Secretariat staff and the Oceania representative to the Standing Committee met Fiji representatives in Suva. Gave the GoF until 31 October 2003 to promulgate enacting regulations and provide details of coral export quotas or else have its trade suspended again	Clarification immediately sought. Visit to Suva took place in August 2003
Despite reminders, GOF failed to send implementing regulations or coral export details	August to October 2003	Renewed recommendation to Parties to suspend all trade with Fiji in CITES-listed species	31 October 2003
Gazetted the *Endangered and Protected Species Regulations* (2003), sent CITES these and quota details	7 November 2003	Verified quotas and withdrew the recommendation to suspend trade with the Fiji Islands	A week later

Sources: Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (2002a; 2002c; 2002b p. 1-2; 2003b; 2003a p. 1; 2003c; 2003d); FMACC (2003b).

The accuracy of the trade statistics

The accuracy, or otherwise, of coral trade statistics plays an important part in this story. In August 1999, shortly after WCMC report appeared, coral harvesting in the Fiji Islands was the subject of a vigorous discussion on Coral-List (1999). This is an open discussion list maintained by NOAA, which judging by the range of contributions over the past four years, is read by people in many countries (*pers. obs.*). The discussion thread started when a Greenpeace worker, referring to Lovell and Tumuri's (1999) report, requested scientists to 'help balance' the debate by providing information and comment on the impacts of Fiji coral harvesting. For a month, correspondents debated the acceptability of Fiji's levels of coral export. While some questioned the veracity of the figures quoted in Green and Shirley—these simply looked too big—others were prepared to believe them and took the opportunity to strongly oppose the harvest.

Hindsight showed that there were indeed several problems with the Fiji coral export statistics. Because of several administrative glitches including past computer crashes, the figures that Fisheries Division had supplied WCMC were inaccurate (Lovell and Tumuri 1999 p. 47; Preti Singh, Fisheries Division, Suva, *pers. comm.*). The extent of the problems only became clear when Lovell, the Fisheries Division's consultant, analysed packing lists supplied by the exporters. He concluded that Green and Shirley's statements about the quantities of coral exported from the Fiji Islands were inflated, a matter he communicated to the authors (Ed Lovell, Suva, *pers. comm.*). The export figures Green and Shirley used were the maximum values permitted by the Fisheries Division, as specified on export permits, not actual quantities exported. They were inflated because exporters had, as a matter of convenience, applied for a quantity well in excess of the amounts likely to be shipped—between four and ten times higher than what had actually been exported (Lovell and Tumuri 1999 p. 47; Lovell 2001; Ed Lovell, Suva, *pers. comm.*). There were other sources of confusion including the way that the Fisheries Division's export data had combined curio coral and live coral statistics. Also, live rock lumped together with coral vastly inflated the statistics for coral exports, especially after the live rock trade grew rapidly in the mid-1990s. The WCMC figures also included significant amounts of coral that Fijian exporters had obtained from other countries and trans-shipped (Lovell and Tumuri 1999 p. 46).

By late 2004, there are still no accurate figures on Fiji's coral exports—I endeavoured to obtain these from the authorities over the course of 12 months but no-one professed to have an accurate account. The best available ones are those on the CITES web site (maintained by WCMC). These are based on figures supplied by importing countries and not those supplied by Fiji; WCMC had found that the Fiji CITES Management Authority's data for 2000-2002 was missing much information and has sought further clarification from the Authority (Helen Corrigan, UNEP-WCMC, *pers. comm.*). There are also problems with the statistics in the CITES database. Live and dead corals are sometimes muddled. Live rock is included as coral rather than distinguished from it, and is sometimes coded as dead coral and sometimes as live coral. Furthermore, it is difficult to get a sense of the total quantities involved because the units used to record shipments vary. They are sometimes recorded as pieces, sometimes as kilograms, and occasionally as bags or cartons. All quantities must be considered when calculating total quantities of exports but the different measurements are not readily equated; some analysts

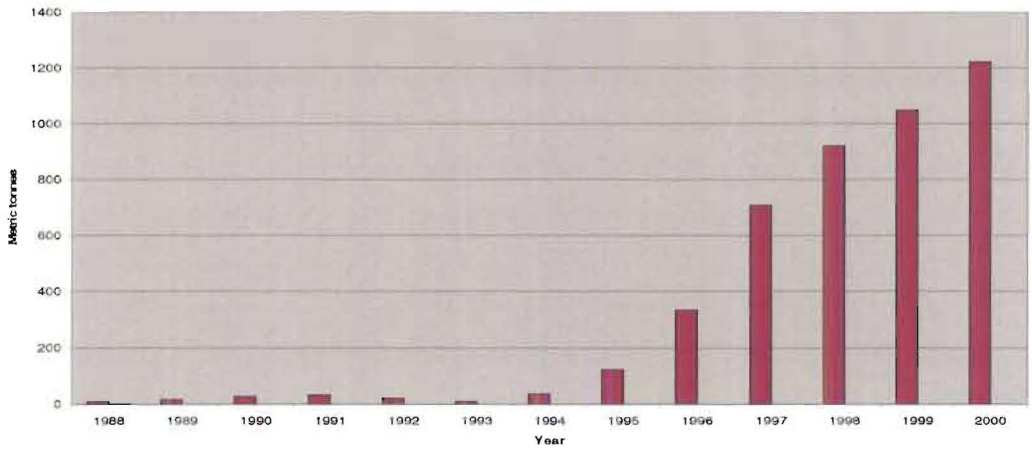
(including Green and Shirley) use standard conversions for different coral species (pieces to kilograms), but the conversion factors used for live rock remains problematic.

TABLE 21: ESTIMATED WILD-HARVESTED CORAL EXPORTS FROM THE FIJI ISLANDS, 1988-2000

Year	Live coral		Raw/dead coral			
	kilogram	*pieces*	*kilogram*	*bag/carton*	*pieces*	*carvings*
1988	0	880	0	0	26752	10
1989	0	1136	0	0	44864	0
1990	0	15196	0	4	54238	1026
1991	0	12604	0	3	73062	275
1992	0	741	0	0	57509	2
1993	2046	2224	0	0	18794	7
1994	12870	21599	4403	0	25917	1455
1995	89839	48209	0	0	38380	9
1996	238816	81104	46876	0	49647	0
1997	356649	131216	250381	0	137365	2
1998	349396	152525	452179	0	161487	1
1999	0	282801	883180	0	154100	0
2000	182714	168038	896538	0	208781	125

Source: net export trade report generated from the CITES web site by Helen Corrigan, UNEP-WCMC, in July 2004, subsequently edited to remove coral transhipped through the Fiji Islands.

FIGURE 7: QUANTITIES OF WILD-HARVESTED CORAL EXPORTED FROM THE FIJI ISLANDS, 1988-2000



Source: the data in Table 21 above, utilising standard conversions of 0.5 for carvings; 0.375 for other corals and 40 kg weight for cartons.

Table 21 contains my best estimate of the size of Fiji's coral trade since 1988, based on the data that WCMC supplied in July 2004. This table, and the accompanying chart (Figure 7), show the considerable increase in total quantities exported since 1995, the first signs of which (in 1995 to 1997) Green and Shirley had noticed. What Green and Shirley did not perceive, however, was that much of this increase was due to the export of live rock rather than to particular species of Scleractinian coral. Being much heavier than coral pieces, and being exported in full container loads, live rock has made up most of the recorded weight of coral exports since 1995. This cannot be seen from the CITES/WCMC data because WCMC does not hold accurate statistics on live rock exports and lumps it into the totals for coral exported. Although small quantities of live rock had been exported from the Fiji Islands since the mid-1980s it was not until 1995 when Walt Smith International started operating in the Fiji Islands, that the industry expanded (Smith 2002; Ed Lovell, Suva, *pers. comm.*). Since 1995, the company's live rock exports have grown steadily to over 500 tonne per annum, collected from several sites in rotation (Smith 2002; Wesson 2002 p. 5; Ed Lovell, Suva, *pers. comm.)*. Three other companies also export live rock. Although I could not ascertain exact quantities exported each year since 1995, I did obtain figures for 2001. That year, Fiji exported 1300t of live rock, of which 561t came from Walt Smith International (Ed Lovell, Suva, *pers. comm.*; Walt Smith International's data supplied to Mr. Lovell by Tim McLeod of that company). (The previous year, Walt Smith International had exported 541t according to Tim McLeod.)

Thus the overall increase in coral exports in Table 21 and Figure 7 mirrors a dramatic increase in one particular trade, that in live rock. It is highly likely that the steady rise in quantities of corals exported from the Fiji Islands which Green and Shirley (1999) noted and which was debated on Coral-List, was due largely to expansion of the live rock trade. It is less clear whether there has been any significant increase in the harvest of particular species of Scleractinia listed in CITES' Appendix II, since the relatively huge weights of live rock mask this. Yet CITES treated all Scleractinia species harvested in the Fiji Islands as being at risk from overharvesting due to a supposedly dramatic increase in overall export quantities. It lacked any species-specific data on this however, and could not statistically justify any such assumption. Furthermore, CITES had no evidence that live rock, gathered intertidally, endangers particular species of Scleractinia growing subtidally.

When this analysis is combined with observations, in Chapter Eight, about the reports on the global coral trade, it shows the widespread disregard for accuracy in export statistics held by the various groups involved in managing the trade, the CITES Secretariat included. In citing as one of the reasons why its suspension of Fiji's trade should continue, despite the effect of the 2000 coup on Fiji government' department's ability to conduct their work, the CITES Secretariat stated that the country's significant trade in corals was having a detrimental effect on the survival of the species being exported. It based this assumption on the export statistics WCMC had produced, which were inaccurate for the reasons discussed earlier in the chapter, and which mixed quantities of live rock and scleractinian corals together (Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora 2002c). As the Secretariat received further information about the size of the trade, particularly the statistics for live rock, it never acknowledged publicly that the way it had depicted the seemingly urgent need to address Fiji's trade might have been based on miscomprehensions about the

size of the trade in scleractinian corals. Instead, it re-justified its efforts in terms of the need for capacity building. CITES subsequently started a capacity building project in the Fiji Islands, part of its efforts to target small island developing states.

The Secretariat's misunderstanding over the size of Fiji's trade in corals affected the reduction in export quotas they sought from the Fiji government. Although there is no specific requirement within the text of the convention to establish quotas to limit trade in listed species, annual quotas are a tool that CITES often uses (CITES c.2003). Intended to meet the convention's requirement that exports will be non-detrimental to the survival of the species concerned, they specify the maximum numbers of specimens to be exported in a year, at a level believed not to be detrimental (ibid). Although the Secretariat describes quotas as voluntary, they were anything but in this case.

The policy of a 50 percent reduction was the secretariat's, not a joint decision with the Fiji government (FMACC 2003a). Using its suspension of trade in early 2002 to pressurise the government to agree to a plan of action, secretariat staff had included the setting of annual quotas for all coral species and for live rock in their list of conditions for lifting the suspension. The Fiji government, through the Department of Environment and Fisheries Division, acting in consultation with the Fiji Marine Aquarium and Curio Coral Council (a government advisory group including exporters and TRAFFIC representative Rob Parry Jones) subsequently developed quotas "in good faith, acting upon the guidance and interpretation provided by the CITES Secretariat" (Rob Parry Jones quoted in FMACC 2003b). It was therefore of some surprise to council members that, after verifying and publishing the 2003 quotas on their web site, the CITES Secretariat wrote to the Department of Environment stating that the 2003 quotas should represent a 50 percent reduction in the actual trade in 2001 not, as calculated, a 50 percent reduction in the quotas set for 2001 (the latter presumably being a larger quantity, based upon the levels at which the Fisheries Division had been issuing export permits). The Secretariat subsequently withdrew approval for the 2003 quotas and Jim Armstrong of the Secretariat revised these during a visit to Suva a few months later (Preti Singh, Fiji Fisheries Division, Suva, *pers. comm.*).

Modes of power

In these actions we see the simultaneous exercise of several modes of power, not just the coercion of negative sanctions. The Fiji government conceded to the authority of the CITES regime, yet at the same time, Department of Environment staff attempted to negotiate with the CITES secretariat over its imposed deadlines. In Weber's terms, the CITES secretariat secured the Fiji government's assent within the regime's 'structures of domination'—the institutions by which it controls international trade (Allen discusses Weber's interpretation of authority in 1999 p. 206). To span the distance between Switzerland and the Fiji Islands, the CITES' regime acted through the Department of Environment, enrolling that department in their act of coercion. Department of Environment staff, also Rob Parry Jones of TRAFFIC, drew on CITES' authority when they encouraged the industry players to conform and Fisheries Division staff to agree—the power of persuasion combined with authority. Given the ability of CITES to stop the trade merely by issuing a directive, the department did not need to demonstrate its own power, it merely acted as a translator station in the transference of that power. In

electing to support CITES' stance, Department of Environment officials chose to drew on associational power (in the sense described by Arendt and discussed in the previous chapter). So too did TRAFFIC, acting together with CITES in what both parties saw as a legitimate common endeavour. In Allen's terms, power was being used not just in a hierarchical, instrumental way but also in a lateral mode in order to fix a collective orientation, negotiation sitting alongside coercion and authority (Allen 1999 p. 210).

There were clearly tensions within the outwardly cooperative framework within which CITES works (described in the text box *Introducing the Players: 1. CITES* in Chapter Five). CITES' style of cooperation features a large dose of coercive power, controlling voluntary action not by force but by sanctions on trade. CITES was decidedly coercive not just in threatening to suspend Fiji's coral trade then actually doing so, but also in the way it set annual national export quotas. This coercive attitude is evident in Table 20.

In noting this attitude, it is important to recognise that, in dealing with the Fiji government, CITES is not a single actor with a single, unified approach. Staff in the Secretariat and those on the Standing Committee had different approaches to obtaining the Fiji government's cooperation in complying with the convention. The Standing Committee showed some leniency in allowing time and encouraging the government to address the various compliance issues. In contrast, Secretariat staff allowed little leeway. As, over time, they had more contact with the Department, their distrust of its ability to manage the trade appeared to grow. The central issue had changed from concern at the size of the trade to concern about the Fiji government's ability to control the trade. On at least three occasions between February and April 2003, Secretariat staff replied to evidence of progress sent it by Department of Environment (e.g. a copy of the newly gazetted legislation and information about the proposed quotas) not with thanks or encouragement but with immediate demands for responses on other matters.

One reason why senior staff in the Department of Environment appeared willing to put up with the heavy-handedness of the CITES staff may well have been because they thought the industry needed firmer regulation (Epeli Nasome, Head of the Department of Environment, Suva, *pers. comm.*). Moreover, the *Endangered and Protected Species Act 2002* was the first piece of legislation to give the Department a legislative role; it was in effect the Department's first step towards having a regulatory role in protecting Fiji's environment and as such must have been welcomed. In the Fiji Islands, staff of the Department of Environment were not alone in thinking the industry needed firmer controls. Both the Tourism Department and some provincial governments wanted to shut the industry down. The Fisheries Division, on the other hand, saw its role as being to assist, as well as manage, the industry (Department of Environment Fiji 2002 p. 4; FMACC 2003a). Consequently, there were tensions between the two departments, seen when Department of Environment staff refused to accept Lovell and Tumuri's study as valid on the grounds that the Fisheries Division had commissioned it and the report's authors had worked closely with the exporting companies in compiling it. This compromised the report in the Department of Environment's view, particularly since the Fisheries Division had forced exporters to pay for it on threat of losing licences (Ken Mackay, *pers. comm.* November 2003).

The actions of various CITES groups (mainly the Secretariat and Standing Committee) towards the Fiji government between 1999 and 2004 were hardly benevolent towards the Fiji government. While the motive of individual CITES staff is not clear (I was not in a position to interview them nor did I meet them), Rob Parry Jones of TRAFFIC did reply to a comment from a Fisheries Division staff that "Leniency to some parties and not to others would not be beneficial to the overall implementation of the convention" (reported in FMACC 2003b). This suggests that because some parties might be rogues, all should be treated as if they too might be. Alternatively, the heavy handedness may be the way in which Secretariat staff routinely apply the precautionary principle. The CITES strategic plan states that "Where uncertainty remains as to whether trade is sustainable, the precautionary principle will prevail as the ultimate safeguard" (CITES 2003 p. 1).

One might assume, from the Department of Environment's distrust of the working relationship between Ed Lovell, the Fisheries Division and the operators, that the operators were the villains in all this, wilfully overfishing the resource. Yet, even in the late 1990s, when concerns about the increasing size of Fiji coral exports were being publicised, Fijian exporters were trying to persuade the government to pass regulations in accordance with CITES (Ken Mackay, *pers. comm.* November 2003). At times there must have been tensions between industry and the Department of Environment, given the inability of senior departmental staff to provide the CITES Secretariat with requested details in a timely fashion. It was not until TRAFFIC placed Rob Parry in Suva in early 2003 to work with Department of Environment staff, that the Department was able to fill the CITES Secretariat's demands and timetable, thus averting further sanctions. Funded by the Foreign and Commonwealth office of the British government for three years, and supported by TRAFFIC's Oceania office in Australia, Parry Jones quickly established cooperative working relationships with both the government agencies and exporters. He was able to retrospectively compile Fiji's annual reports to CITES. Nevertheless, the exporters had to suffer suspension of trade due to the government's inability to meet the CITES Secretariat's timetable, yet they themselves were unable to hurry the government up. They continued to cooperate however, to ensure that the industry would not be closed.

This simultaneous exercise of multiple modes of power evident in this study of CITES control of the coral trade illustrates the complexity of the situation. This complexity is further illuminated when other efforts to manage Fiji's export trade in coral reef organisms are added to the story.

MAC'S CERTIFICATION OF THE MARINE ORNAMENTALS INDUSTRY

How MAC became involved in the South Pacific

Several of the same exporters (those exporting live coral rather than curios) have been involved in a second scheme to manage the environmental effects of exporting coral reef organisms, one with a very different policy approach—MAC's commercial certification of the aquarium trade (Chapter Seven). At the same time that CITES was leaning on the Fiji government to put controls on the export of corals, this second scheme was being introduced to the Fiji Islands.

As with coral harvesting, the Fisheries Division had been managing the export of reef organisms for the marine aquarium trade ever since interested exporters first raised the possibility of live aquarium fish

exports in the early 1980s. Although the export of live fish is prohibited under Regulation 26 of the Fisheries Regulations (Cap. 158 as amended), the Permanent Secretary had granted some exemptions (under Regulation 27) to allow the industry to develop, subject to Cabinet guidelines approved in 1984. These specify that licensed operators must be of high international repute with a proven record in the trade; also that resource custodians must be involved in the collection as much as possible and must be trained for this. Operators are required to ensure collection does not conflict with other uses such as tourist diving. They are prohibited from using chemicals or poisons, The regulations also allow the Department to place a ceiling on the total number of fish exported each year (Richards *et al.* 1994 p. 61). This was the situation when, in the late 1990s, the possibility of instituting MAC's fledging scheme (Chapter Seven) was raised.

While CITES' approach to trade in corals is reminiscent of the Keynesian style of environmental regulation typical of developed countries post-war, reflecting the 1970s origins of that convention, MAC's scheme is distinctly neoliberal. Rather than trying to improve state regulation of exports, those involved in founding MAC had designed a market-based scheme aimed at both harvesters, exporters and importers, and regulated by international auditors. They concentrated on those reef organisms exported as marine ornamentals but not covered by CITES—mainly fish. MAC's scheme was created when neoliberalism was in its ascendance in large multilateral development agencies, a time when private sector partnerships for marine conservation had come into favour in North America. It was a time when the World Bank had recently launched its Marine Market Transformation Initiative aiming to transform unsustainable industries into green ones through partnerships with key stakeholders (Global Biodiversity Forum 1997). Around the same time WWF International and Unilever launched the Marine Stewardship Council, designed to create voluntary third-party certification of fisheries and labelling of seafood products. The IUCN was promoting private sector partnerships in the marine and coastal environment, and MAC's instigators promoted their fledging scheme at an IUCN workshop on this subject held at the Eighth Global Biodiversity Forum in August 1997 in Montreal, Canada (ibid).

Although not subjected to the same degree of international concern as the country's coral trade, Fiji's marine ornamentals industry was caught up in these efforts to take a neoliberal approach to the industry. Although concern about the marine ornamentals industry in Southeast Asia provided the initial impetus for establishing MAC, once formed, the NGO included the South Pacific in its sphere of operations. The Fiji Islands and various other Pacific Islands were enrolled in efforts to get the MAC scheme up and running, not as a response to environmental concern expressed in international circles as happened over the coral trade, but through a particular a chain of circumstances catalysed by certain professional contacts and interests. MAC's interest in the Pacific came about because Paul Holthus, appointed to run MAC in mid 1998, had previously worked at the South Pacific Commission and the East-West Centre in Hawaii. Another reason why MAC became involved in the Pacific Islands is attributable to the Canadian Government, then funding the Canadian International Development Agency's Canada-South Pacific Ocean Development Programme (C-SPODP), a programme placing a private sector adviser at the Pacific Islands Forum Secretariat in Suva. When, in 1998, the Forum Secretariat requested information on opportunities for fish exports to North America, the C-SPODP adviser commissioned a Canadian consultant Jamie Baquero to research the potential sustainability of

the trade in the Pacific (Baquero 1999a also Ken Mackay, Suva, *pers. comm.* November 2003). In his report, Baquero advocated the MAC scheme, then being developed—Baquero was vice-president of Ocean Voice International, active in projects in the Philippines (mentioned in Chapter Five) and a member of the MAC working group (Ken MacKay, Suva, *pers. comm.* November 2003; Baquero 1999b).

Following Baquero's favourable report, the C-SPOPD private sector adviser wrote a proposal for MAC to run a pilot certification programme in three Pacific Island countries starting with the Fiji Islands which had the most established marine ornamental industry in the Pacific, then extending it to other islands if successful (Ken MacKay, *pers. comm.* November 2003). C-SPOPD funded a MAC coordinator based at the Forum Secretariat. The project was designed to be implemented in two stages—national consultations and workshops to be held first and profiles of local industry compiled, following which staff would work directly with companies wishing to be certified.

Scheme approved with little analysis of the policy options

Besides the approval of Forum Secretariat and Fisheries Division staff, there were two further endorsements of MAC's plans to work in the Fiji Islands. Participants at a national workshop on marine ornamentals certification, held to discuss both the certification option and problems with the coral trade, voted unanimously to implement certification (Joshua Mael, Forum Secretariat, Suva, *pers. comm.*.). The workshop was held immediately after a regional marine aquarium trade workshop organised by SPREP and funded by USAID's East Asia and Pacific Environmental Initiative. The Fiji workshop was the first time that industry people and staff from various departments (Fisheries, Environment, Tourism, and Fijian Affairs) had collectively discussed the industry, the stand-off between the Environment and Fisheries departments having previously precluded this (Ken Mackay, C-SPODP coordinator, Suva, *pers. comm.*, November 2003).

In addition, Fisheries Division staff held a series of workshops with resource custodians, and told them about MAC's scheme; the custodians agreed with the department's idea that the scheme should be made compulsory (Preti Singh, Fiji Fisheries Division, *pers. comm.*). Because of the government policies stipulating that only indigenous Fijians can harvest coral in their own *qoliqoli*, and that that resource custodians are to be involved in the collection of aquarium fish as much as possible and must be trained for this, village collectors must be involved in achieving certification of ecosystem and fisheries management.

The head of the Fiji Fisheries Division gave the scheme their wholesale approval, announcing to operators in mid-2002 that their export licences would not be renewed if they did not obtain certification—largely bluff because he had not sought approval from the Minister or Cabinet for this (*pers. obs.* at MAC workshop, Suva). Despite this public expression of approval, it was never clear that senior staff who gave the scheme their stamp of approval ever really understood its policy implications. Unfamiliar with quality management systems, they were probably unaware of the extent to which the scheme takes policy control out of government hands and puts it into the hands of auditors and those who formulate the standards. There was, however, considerable willingness to see the scheme's implications as at worst benign for the government.

Since MAC and the industry had all the work to do in achieving certification, Fisheries Division staff probably saw the scheme as a relatively easy way to manage the industry, at little cost to the department. The department announced its policy on compulsory certification at the time when it was publicly pushing the idea that before the government carried out its stated policy of handing back the control of fisheries in the *qoliqoli* areas back to the customary owners—an approach that would leave the department with only an advisory role in inshore fisheries management—there should be resource surveys of every *qoliqoli* area to establish the size of stocks. Having the stock inventory surveys done for those areas used by the marine ornamentals trade must have seemed a partial solution to this daunting undertaking.

Underlying the various cooperative relationships needed to implement this market-based scheme, is a distinct laissez faire attitude to policy at both regional and government level—a willingness to go along with whatever is on offer if it involves aid funding, rather than any conscious commitment to change to a neoliberal approach, or any deep philosophical commitment to the latter. Neither the regional policy office involved, the Forum Secretariat, nor the Fiji government thoroughly analysed MAC's policy approach to the industry before allowing the scheme to proceed. When Forum Secretariat staff initially approved this pilot project (one of three items in the package C-SPODP proposed funding), they did not analyse the merits of the various alternatives. It was not until 2003, when the MAC project was in full swing, that Forum Secretariat staff recognised that it was time to step aside and consider what role they should play and what their policy should be (Joshua Mael, private sector adviser, Forum Secretariat, Suva *pers. comm.*.). This is surprising considering that the Forum represents itself as the primary policy agency in the region.

Fisheries Division's coercion was one, but not the only, reason why exporters entertained the scheme despite the onerous paperwork requirements. The three largest exporters could also see the commercial advantage it might bring (Tim McLeod of Walt Smith International and David Oliver of Fiji Fish, *pers. obs.* at the MAC workshop, October 2002). Their cooperation may also have been a response to the fear, circulating in 1999/ 2000, that the US government might stop the trade altogether. At that time MAC lobbied the US government, presenting certification as a suitable way of addressing the trade's adverse environmental effects (Ken MacKay, C-SPODP coordinator, Suva *pers. comm.* November 2003).

The Fiji Fisheries Division's idea of making the scheme compulsory conflicted with the basic premise underlying the scheme, that by choosing to join it, exporters gain a commercial edge over non-certified operators. Senior MAC staff, present in Suva at that time to run the workshop for exporters, quietly concurred with this coercion even though requiring the certification scheme to be compulsory changes the whole dynamics of it. They deliberately chose not to discuss those dynamics with industry and Fisheries Division staff and by doing so, appeared keener to ensure that the scheme was implemented than they were to maintain the integrity of scheme as a voluntary market-based instrument (*pers. obs.*; also conversations with Peter Scott and Razel Kusumaatmadja, MAC, Suva). This suggests the interest of MAC staff as another factor driving the scheme's implementation in the Fiji Islands.

Modes of power

In MAC's initiative in the Fiji Islands, we see the exercise of a different mode of power from the coercion of negative sanctions that CITES secretariat aimed at the Fiji government. Like the FIME and LMMA schemes described in the previous chapter, MAC's scheme is based on the notion of associational power *sensu* Arendt, people acting together for a common purpose. Yet, in the design and execution of a scheme intended to mobilise people in the pursuit of the common purpose of putting the marine ornamentals trade on an environmentally sustainable basis, different modes of power are being exercised. Here is the power of seduction: for those MAC employed, the allure of professional jobs, salary and status; for the government, the seduction of aid funding, for exporters, the inducement of gaining an edge on competitors. There is the power of persuasion: MAC officials endeavouring to persuade exporters of the merits of the scheme. There is also manipulation—in the way that the Fisheries Division officials portrayed certification as mandatory, and in the way that MAC's overseas staff quietly ignored how this rendered their scheme illogical. These are the same modes described in the previous chapter, suggesting similar dynamics amongst the NGOs involved.

The nature of cooperation: multiple actors and tense relationships

Initial progress on the C-SPODP/MAC certification project was slow (something attributed to the local project manager, later replaced) (Ken MacKay, C-SPODP coordinator, Suva, *pers. comm.*). It was not until 2002 that steps were taken towards getting Fijian exporters certified. Through staff in its Suva-based regional office, MAC worked with three largest of the Fiji exporters, all of whom had signed a Statement of Commitment with MAC, to develop policy and procedures manuals and collection area management plans, all steps towards certification (MAC 2002). In December 2003, the largest of the Fijian exporters, Walt Smith International, received certification for all three core standards (ecosystem and fisheries management; collection, fishing and holding; and handling, husbandry and transport) and four collection areas. Until the C-SPODP project terminated in late 2004, MAC project staff continued to work with other exporters, one of which was nearing certification standard at that time (MAC 2004b, 2005).

Obtaining MAC certification for exporters was only one of several steps being taken to put Fiji's marine ornamental industry onto a neoliberal footing. Another thread entailed working with Fijian collectors, in their home villagers. MAC staff in Suva started training Fijian collectors in both harvesting and post-harvest techniques in 2003 (MAC 2004a). WWF-Fiji, in a joint project with MAC, worked with villagers at Malomalo on the Coral Coast of Viti Levu where the villagers have harvested live rock for export since the early 1990s and where WWF-Fiji had worked on various community projects since 1999 (Owen 2003 p. 38). WWF-Fiji helped the Malomalo community improve harvesting practices and develop a collection area management plan, a pre-requisite for certification under MAC's fishing and ecosystem standard (Owen 2003). They also encouraged them to designate part of their traditional fishing grounds a *tabu* area where extraction is banned (a FLMMA tool described in the previous chapter) (Owen 2003 p. 38).

Another Suva-based NGO helping Fijian villages implement MAC's scheme is the Pacific regional NGO, Foundation for the Peoples of the South Pacific (FSPI), whose director Rex Horoi has been on

MAC's board since the latter's inception. FSPI obtained European Union funding to work with various Pacific Island communities, in a project named the Sustainable Management of the Marine Aquarium Trade (SMART) initiative, in partnership with Just World Partners, a British member of the international FSPI network (Marine Aquarium Council 2003). MAC helped FSPI obtain the funding, writing much of the bid but submitting it in FSPI's name (Michelle Lam, MAC, Suva, *pers. comm.*). While MAC sees the project as a way of instituting market-based control on the trade, FSPI, in accordance with their mandate and general policy, are focusing on helping communities help themselves—alleviating poverty by building a sustainable marine ornamentals industry based upon ecosystem management planning. The working relationship between MAC and FSPI staff in Suva was at times tense, especially in 2003-4 (Jeff Kinch, FSPI and Michelle Lam, MAC, both Suva, *pers. comms*). One contributing factor has been ill-defined lines of responsibility and accountability where the two projects intersect, leading to disagreements who has project oversight, directional control and responsibility for monitoring progress (Michelle Lam, MAC, Suva, *pers. comm.*.). Also underlying this tension is a different approach to community work. The two NGOs have different models for this. MAC's approach envisaged education and training for collectors. FSPI had a more empowering attitude, helping communities to achieve what they wanted for themselves. This reflects a fundamental philosophical difference.

The situation was not been helped by confusion regarding who needs to be certified, the exporting company or the community collectors (interviews with Michele Lam, Hugh Govan and Jeff Kinch, see Appendix). This arose in part because the only experience that senior MAC staff had with certifying collectors and collection sites was in Indonesia, a different political and cultural situation to the one in the Fiji Islands (there being no equivalent of the *qoliqoli* system or government pressure to respect indigenous rights). Also, the local staff MAC employed to manage the project had no experience in quality management systems—and this is essentially what the scheme is. The consequence was considerable confusion, and 'winging-it' for the community part of the certification scheme. Even as some of the exporters prepared themselves for assessment, it was never clear whether the communities owning and collecting the organisms would also require certification under the ecosystem standards, or whether the exporting companies could do this on their behalf (Michelle Lam, MAC, and Hugh Govan, FSPI, both Suva, *pers. comms*). Although, in the case of Walt Smith, the company obtained the certification, both WWF-Fiji and FSPI are preparing communities to seek certification.

This confused situation continues to evolve. Rather than seeing the people who are trying to establish MAC and its scheme as experts with the knowledge and experience to save the industry that the USCRTF had threatened to close down, it is just as easy to see them as people who did not know what they were doing and are learning or making it up as they went along. The expert is illusory.

But it is not just the different conceptual models that cause tensions, as yet another view of MAC, as a fraudulent phony, illustrates. Senior members of an NGO engaged in a similar business—IMA, introduced in Chapter Five—have propounded this view. In emails to me, Peter Rubec, a key member of IMA suggested that MAC had aligned themselves with industry to the detriment of conservation, an act he called 'greenwashing'. Rubec was concerned that MAC staff were conducting their certification

process behind closed doors, refusing to acknowledge calls for peer scrutiny and debate, and stonewalling his and others' requests for documentation such as collection management plans (email *pers. comm.* 31 July and 2 August 2004). In this he implicated not just Paul Holthus of MAC but also key contacts in WWF, TNC, the PIJAC, Reef Check and a venture capital firm backing MAC's latest international efforts (email *pers. comm.* 2 August 2004). While these accusations may reflect moral concern about possibly fraudulent activity, they may result from tensions generated by the competitiveness of NGO fund-seeking and of professional conservation on the international stage. Within IMA itself there have been conflicts, shown in the following statement by someone involved in original PIJAC 'fact-finding' mission to the Philippines in the early 1980s (Chapter Six) who went onto help found IMA:

> I quit IMA over the personal gain, malfeascence embezzling syndrome...so germane to today's eco movements. My writings and photos from a year in villages predates the IMA, PIJAC and MAC et al. Instead of joining me in solving the problem there has been one attempt after another to cash in on it. That's why a true believer and an honest person has no other course but to resign. There has been a 20 year squandering of the issue and the reefs are far worse off for it. Ironically though, the issue was sold out by "money grubbing environmentalists" of a most elitist orientation. I'm a fisherman...commercial fish collector by trade. And I always wanted the locals to be the centrepiece of the reforms. Eco-administrators always resented that as they wanted to be the centrepieces of the efforts. The real reef environment could've been saved... the divers could've been trained and put on the right track. Anglo money grubbing environmentalists build up and sustained by Packard, Macarthur, the WWF, USAID etc. minimalised the fisherman and allowed the prima-donnas to prevail. Tax write offs may well be their primary aim in all this so-called mega funder environmental activity. The environment itself ...in all the groups and BODs [NGO Boards of Directors] I have been privy to was rarely a topic of concern (Steve Robinson, email *pers. comm.*, 2 August 2004).

METHODOLOGY: EMAIL CONVERSATION

The emails I have quoted from Rubec and Robinson (above) and Why (below) were four of several I received after sending an email to Robinson and to Vaughan Pratt, IMA president, asking for a brief account of how IMA was founded and inquiring about the governance structure of IMA. I had included an explanation of the nature of my research; that presumably identified me as someone who might potentially be interested in 'exposing' MAC. Rubec sent me a list of his concerns in the hope that I would choose to follow them up. That my simple email query elicited such replies suggests the potency of the tensions boiling away, ready to spill over. The only connection I had to these people was through my husband who knew Steve Why (whom I had met briefly once). I was a virtual stranger yet they chose to share their concerns with me. Interestingly, I never did receive any information about IMA's history or governance structure from those replying to my email, something I did not notice until writing this chapter months later.

There are also professional disagreements over MAC's efforts to develop standards for the live reef food fish trade (Chapter Eight), specifically the standards for live groupers captured and shipped by Asian boats to Hong Kong. "I don't believe [these exports] can be done sustainably and, in my professional opinion, [this] is not suitable as a subject for MAC standards—reasons include different SE Asian consumers and values, for a start (lacking environmental values as we might define them)", (Steve Why, IMA, Hawai'i, email *pers. comm.*, 4 August 2004). In the next section, I examine how Pacific players have been included in these efforts to develop global standards.

GLOBAL STANDARDS FOR THE LIVE REEF FISH FOOD TRADE

The trade in the Pacific: initial efforts to manage its effects

Chapter Five described how the live reef fish food trade progressed from Southeast Asia to the Pacific. This expansion prompted staff from SPC's Marine Resources Division and from TNC's Asia-Pacific Coastal and Marine Programme to suggest the two organisations collaborate and share experiences with IMA and WRI, two NGOs with knowledge of the Southeast Asian trade. In December 1999, these four organisations formalised their relationship through a three-year memorandum of understanding outlining a proposed Pacific regional live reef fish trade initiative (Smith 2003). SPC staff used a regional fisheries meeting to obtain from Island representatives a mandate to co-ordinate a Pacific initiative providing scientific, policy and management advice about the trade to Pacific Island governments and communities. They obtained ADB funding for three and a half years funding for a joint SPC- IMA-TNC regional assistance project, starting December 1999. This funding allowed the project partners to carry out biological and trade activity assessments in several Pacific Islands countries, and to provide policy and technical advice to island government fisheries agencies, develop public awareness materials about the trade (TNC's main role), and run a regional workshop, held in Suva in 2002 (Yeeting 2003). SPC later obtained further funding from the MacArthur Foundation and the Packard Foundation to train fisheries officers and prepare handbooks (Yeeting 2002).

Development of the trade in the Fiji Islands

When interest in participating in the live reef food fish trade arose in the Fiji Islands in the late 1990s, the Fisheries Division had initiated a trial export (that mentioned in Chapter Nine). The Government formally requested SPC's assistance in assessing the trade's potential in the chosen area (the Bua province, Vanua Levu), and in drafting preliminary management guidelines (Yeeting 1999). Rather than directly cooperating with interested NGOs, the Fiji government has continued to work with and through SPC on this issue. In its publications detailing the nature and impacts of the trade elsewhere, SPC gave the Fiji Fisheries Division the basic information it needed to develop a precautionary policy approach to the trade.

In the Fiji Islands, the trade has been controversial. In early 2000, the chairman of the Lau Provincial Council Ratu Sir Kamisese Mara (then prime minister) stopped an Asian company from exporting live fish from Lauan waters (Ragogo 2000). Ratu Mara had earlier given the company permission to fish, but a group of USP staff from Lau, along with representatives of WWF-US and of the South Pacific Action Committee on Human Ecology and Environment (SPACHEE, a NGO based at USP) lobbied the

Lau Provincial Council about the trade's environmental impact (Institute of Applied Sciences 2002). When the Lau Provincial Council subsequently requested assistance from the Fiji Fisheries Division, the Government again sought SPC help, leading to a survey of the reef food fish resource in the Lau Islands in August-September 2001 (Secretariat of the Pacific Community 2001). Both SPC and IMA were involved, IMA having recently set up a small office in Suva to look at the sustainability of the country's live reef food fish and aquarium fish trades (International Marinelife Alliance 2000, 2001).

In licensing two exporters, the Fisheries Division only allows them to buy fish, not to fish themselves. They are required to have a local partner, as well as approval from resource custodians and provincial administration. The Department has banned export of live fish by ship, in order to limit the amount of fish exported and to reduce the mortality levels (Chan 2001). Although by 2003 the department had adopted a policy guideline, it still regarded the operation as a trial subject to further stock assessment. It required exporters to have observers with them when harvesting, in order to increase departmental knowledge about the industry. Fiji Fisheries Division staff have been following progress of the international project team developing global standards for the trade (Chapter Six). When those are complete, the Department intends to review its policy on the trade and adopt the standards if they appear appropriate (Ovisi Ledua, Fiji Fisheries Division, Suva, *pers. comm.* November 2003).

Moves towards global governance of the trade

Attempts to develop global standards for the live reef food fish trade, described in Chapter Seven, have entailed cooperation between NGOs and their funders, APEC, the US government and US foundations. A small group of people from three NGOs (IMA, MAC and TNC), along with a member of the Hong Kong Chamber of Seafood Merchants, initially drafted standards, which 'experts' from government, industry, academic institutions and NGOs then reviewed (Kusumaatmadja *et al.* 2003 p. 48-49; Kusumaatmadja *et al.* 2004 p. 31). IMA later disassociated itself from the project, believing the trade not suitable as a subject for MAC standards because of the different values of Southeast Asian consumers (Steve Why, IMA, Hawai'i, email *pers. comm.*. 4 August 2004, quoted above)—compared to those in the US and Europe purchasing specimens for home aquaria, presumably. MAC and TNC continued with the standards development, holding workshops in several countries to validate the applicability of the draft standards (Kusumaatmadja *et al.* 2004 p. 31). The Pacific Islands workshop was held in New Caledonia in conjunction with the 3rd Heads of Fisheries meeting at SPC and was attended by representatives from some Island fisheries department including two from the Fiji Islands (*pers. obs.*). At this, Geoff Muldoon, an Australian employed by IMA, consulted government representatives over the draft standards. He was checking whether these covered the Pacific Islands situation, in a technical sense, rather than consulting them about how the approach they might have wanted to take to the industry. Observing this workshop, I felt the consultation to be more for his own benefit—he appeared to have no experience of how government fishery departments operated in the Pacific Islands or of the practical and political factors shaping their work. He was a technical expert but not a political one. This reflects the nature of these efforts to develop global standards: they are another example of an approach treating environmental issues as technical rather than political matters.

Modes of power

Like MAC's certification scheme, development of the global standards for the live reef food fish trade is another effort to design a means of prompting mutual action and building associational power. In their allure the standards, like MAC's scheme, draw upon the authority of the experts involved in their design. In enrolling people into validating the design at the SPC workshop, the designers are using a subtle type of seduction that draws on their expert authority, the opportunity to contribute to the design of an international policy, combined with the utopian promise of a unified approach to 'global standards' that transcends existing problems. Their allure lies in this promise and the concomitant fear that government representatives have of missing out on something of future value by not participating.

Analysis

FINDING PROBLEMS TO ADDRESS ANSWERS

These three initiatives are all premised on the notion that international cooperation is needed to solve the environmental problems caused by harvesting coral reef organisms for sale overseas. The scale of this cooperation can be seen in the myriad nature of the overseas players concerned about trade in Fijian reef organisms. Organisations include NGOs (TRAFFIC, MAC, IMA, FSPI, WWF, TNC, WRI), an MEA with all attendant internationals involved in its policymaking (CITES), the European Union, and the aid agencies of overseas states (UK's Foreign and Commonwealth Office, Canadian International Development Agency as funder of C-SPODP, USAID). Various commentators and observers are also interested in the environmental effects of exports from the Fiji Islands, including a UN agency (UNEP-WCMC) and the USCRTF. In addition, three regional Pacific intergovernmental agencies, SPC, the Forum and SPREP, each with their own blend of Pacific Island and expatriate staff and their strong links with international agencies, have been involved. Then there are the funders. Through its US Technical Cooperation Trust funding for CITES, the US government has funded much of CITES work on bringing non-complying countries with a significant trade in corals into line with the convention's requirements; it funded a review of trade in corals from the Fiji Islands (Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora 2001a p.9). The Canadian government and EU have funded NGOs working on Fiji's marine ornamentals trade. ADB along with the MacArthur and Packard foundations funded SPC's efforts.

Each of these three initiatives, in its cooperative approach, reflects the global environmental policy discourse. Each construes the effects of the trade in coral reef organisms as a global problem requiring globally co-ordinated action to solve. Additionally, each accords science the expertise to identify the problem. Furthermore the solution in each case—be it national legislation, quotas, and border control; eco-labelling and certification; or global standards—is pre-selected then 'transferred' to the Fiji Islands as one of many problem sites as needing attention. And each finds problems to their selected answers—rather than vice versa as normally assumed.

In the case of CITES and the coral trade, Green and Shirley's (1999) report identified a problem with exports of coral from the Fiji Islands. This justified applying, to the Fiji Islands, the measures already proscribed in that convention, also the setting of annual quotas. In the case of the Pacific Islands marine

ornamentals industry, it was Jaime Baquero, and later C-SPODP and Forum Secretariat advisers, who identified the solution even before a problem had been acknowledged. MAC, and the experts they chose to call upon, determined the details of this solution through the process of developing international standards, the initial step they took when designing the certification scheme. International experts involved in introducing MAC's scheme in the Fiji Islands assumed the problem (reef degradation as a result of the marine ornamental trade) would occur sometime later if they did not implement the solution (MAC's scheme)—thus justifying its application. In the case of the live reef food fish industry, it was the Fiji Fisheries Division which identified a problem that might potentially arise, but SPC in collaboration with TNC, ADB, IMA and WRI which told the department the extent to which the problem might develop, based upon the worst case examples in Southeast Asia. By approaching SPC, the Fiji government became part of a regional project that, like the MAC example, was based on the assumption that if what had happened in Southeast Asia would eventually happen in the Pacific Islands. Although some IMA staff with economic training were saying that would not happen because the economics of the industry were very different (as espoused at the LRFFT regional workshop in Suva, 2002), this did not stop others at IMA and at SPC ensuring Pacific Islands remained part of an international response to the industry. As with MAC's scheme, it was a group of people developing the global standards for this trade who identified the solution and sought to include the Fiji Government. The government (Cabinet plus senior fisheries department officials) wanted to address the new industry responsibly (both in terms of helping it develop and in managing its effects).

THE NATURE OF COOPERATION

The diversity of approaches

The nature of the policy approach used to address the environmental effects of trade in coral reef organisms differs in each of the three cases examined here. CITES used a Keynesian style of regulation popular in developed countries post-war. Both MAC's certification scheme and the efforts to develop global standards for the live reef food fish trade are voluntarist, neo-corporatist regulatory frameworks involving non-binding standards and rules. There is, however, still confusion over how the LRFFT standards might be applied—whether governments will use them as regulatory frameworks as the Fiji Island government proposes, or whether they will operate solely as a market-based approach.

No-one is attempting to link these various Fiji Islands endeavours into a single strategy to manage trade in coral reef organisms; there is no master plan. In each case, Fisheries Division staff appeared willing to adopt whatever policy scheme was on offer. In watching the two efforts to institute market-based schemes proceed, the government has not, however, permitted neo-corporatist bodies that act as keepers of international standards and rules (i.e. auditors) to take over its present role in controlling the trade. To the contrary, the head of the department reasserted his regulatory authority when he indicated that the department would link its licensing permissions directly to certification of the marine aquarium trade and would adopt the LRFFT standards as national standards, should they prove suitable. Furthermore, the Department has retained its licensing and regulatory control over these trades.

Nevertheless, in MAC's case, the formal decision to allow the NGO to operate, the point at which the government could have called a halt to it, was not made not before MAC started its project but sometime later in 2003 (Michele Lam, MAC, Suva, *pers. comm.*). And the project, once it started, would have been difficult to stop, or to alter its approach significantly. But, in waiting to see how the MAC certification scheme and LRFFT standards pan out, the Fisheries Division has foregone the opportunity to develop its own approaches to controlling the adverse effects of these trades. It allowed foreign organisations to take over its role in developing policy for the marine aquarium trade, although reserving the right to reclaim this sometime in the future.

Moreover, neither Fiji government agencies nor the regional intergovernmental agencies involved (SPC and Forum Secretariat) analysed the merits of the alternative approaches to address the adverse environmental effects of international trade in coral reef organisms. Once it became aware of MAC's scheme and the NGOs desire to work in the Pacific, the Fiji Fisheries Division did not consider alternative policy approaches to managing the industry. SPC took a similarly single-minded approach in deciding to support the development of global standards for the live reef food fish trade. The reason why SPC did not analyse the respective policy approaches may be that, until recently, the Marine Resources Section of SPC has focused on giving technical rather than policy advice; although it has been trying to reinvent itself as a policy agency, this is happening slowly because the agency lacks skilled policy analysts (*pers. obs.*, 3rd Heads of Fisheries meeting, Noumea, August 2003).

Reasons for cooperating

These three examples, and the modes of power embedded in them, illustrate a range of relationships involved in institutionalising international policy schemes in this particular country. I have included these under the word 'cooperation' for want of a better term, even though the various actors have different aims and different reasons for collaborating. Schemes such as MAC's offer, to the local people employed to institutionalise them, the same sort of professional advantages as participating in the GCRMN (status, travel, along with an attractive salary). Furthermore, they provide local NGOs such as FSPI with funding to continue their work with local communities. Here, again, is the pursuit of professional advantage mixed with more altruistic notions of experts working together, building a common will to protect nature and/or Fijian communities.

Discourse plays a role in encouraging this international cooperation. When environmental policy is regarded as a beneficial matter for all involved, small governments such as that in the Fiji Islands are often willing to take on board whatever environmental policy schemes are on offer, provided someone else is funding them. The Fiji government clearly values 'expert' help from overseas on environmental matters. At a MAC workshop in 2002, the head of the Fisheries Division Malakai Tuiloa expressed the department's gratitude to NGOs that have chosen to work on marine issues in the Fiji Islands (*pers. obs.*). He also spoke of the department's reliance on SPC for scientific advice on its environmental problems. Thus, the scientific authority of the experts involved in designing the schemes has engendered the department's cooperation.

HEGEMONY IN THE ENVIRONMENTAL TERMS OF TRADE

As close examination of the course of each initiative showed, the spaces in which international policy connections are made with the Fiji Islands are filled with tensions and with power of multiple forms. Thus cooperation, itself, is a power-filled, rather than power-neutral act. The exercise of power was relatively visible in the case of CITES. The government accepted trade on the terms imposed by CITES, some parts of government seeing this as a good thing, others acquiescing in the face of this local opinion and of CITES' demonstration of its power to stop trade. The exercise of power was, however, less visible in the case of MAC and of the live reef food fish trade standards. Yet, as the South Centre has observed (as discussed in Chapter Three), this trend towards neoliberal governance in environmental matters is making a political issue into a technical one, thus reducing the South's political power. The examples of MAC and the live reef food fish trade illustrate how the industrialised bloc interested in maintaining international trade in coral reef organisms used everyday norms and institutions of international environmental policy—the project formations, regional IGO workshops, NGO employment structures and discourse characteristic of that field of endeavour (rather than environmental treaty)—to institutionalise its ideology of trade. The bloc did so in a way in which its exercise of power was not readily visible. This is neo-Gramscian domination, whereby individuals (those working locally for NGOs and government) voluntarily acquiesce but do not experience that power as conflicting with their interests.

Although it seems reasonable to read both MAC's certification scheme and the project of developing global standards for the live reef food fish trade as supposedly environmentally-sustainable schemes developed in order to protect the economic interests of northern importers and retailers in the face of environmental opposition to that trade continuing, it makes little sense to read CITES in that way; CITES was established when the worldwide coral trade was relatively small and before any widespread opposition to it. It makes more sense to interpret CITES in terms of the politics of ecologism, as an expression of contemporary environmentalism (Chapter One). The environmental effects of trade have become a global problem arising out of modernity, something CITES was established to address: a supposedly technical MEA based on the spirit of cooperation, it provides a globally co-ordinated solution based around science, instrumental rationality. Yet, an analysis of power relations entailed in CITES work, undertaken above, suggests that CITES is a political organisation. Furthermore, CITES' style of environmentalism suggests capitalist interests determined to preserve global trade, a matter I discuss more explicitly in the next chapter.

Is CITES hegemonic? It certainly meets the description used by Peet *et al.* (2003, discussed in Chapter Four) when they described the depth of hegemony in policymaking as residing in the ability of a discursive formation to specify the parameters of the practical, the realistic and the sensible, limiting thought and expression. In dealing with the Fiji Government, CITES (officials, and the Standing Committee) brooked no alternatives to their own policy stance and bureaucratic requirements (e.g. for voluntary quotas and enforced reductions). They effectively permitted only one discourse and dismissed other positions as irresponsible; in this they were as hegemonic as the IMF, World Bank and WTO described in Peet *et al.*'s *Unholy Trinity.* For the Fiji Islands, the end result of being part of

CITES is much the same as for neoliberal schemes such MAC's certification of the aquarium trade—it entails outside experts dictating the environmental terms of trade between industrialised countries that import reef organisms, and developing ones such as the Fiji Islands that export them.

In these three trades (in coral, marine aquarium species, and live reef fish for food consumption), experts and technical practices have played key roles in building a hegemonic politics. The technical practices of CITES have helped build hegemony—the reliance on data concerning species and amounts traded that was compiled through single unverified sources, used a variety of units, and relied on species identifications that have been described as notoriously difficult; the exchange of letters and faxes along with the prompt responses to information supplied by the Fiji Government, requesting further information; and the coercive Notifications to Parties issued by the Secretariat. Moreover, the technical practices associated with certification are potentially a source of hegemonic control—standards set by experts from outside the region; 'outside' auditing that brooks little dissent; the threat of losing one's certification. The same applies to the technical practices of forming global standards, which were largely written by someone based in Queensland, who was unfamiliar with the situation in the Pacific Islands (*pers. obs.*).

Additionally, Fiji Islanders may be disadvantaged because the standards being applied are not as scientifically rigorous as they first appear, as I demonstrated here. While agencies like CITES and MAC might portray themselves as addressing the environmental effects effectively, this is not necessarily the case; the notion of policy responses being selected based upon rigorous scientific monitoring and assessment is an illusion. Statistics are used in a sloppy fashion to justify centralised management of the environmental effects of trade. In both MAC and the work on standards for the live reef food fish trade, we find, therefore, another concept of an expert in international environmental policy: someone who is not sure how to do things but who makes it up as they go along, being able to maintain credibility because of the backing of the organisation for whom the project is undertaken.

There is also an element of hegemonic control in the way that each of the three schemes seeks to have any conditions that might be imposed on it for environmental reasons placed by bodies almost entirely outside any Fiji's jurisdiction. They remove the authority to set standards from hands of countries like the Fiji Islands. Neither the Fiji government or *qoliqoli* rights holders have been involved in setting the rules and standards. They were not involved in drafting CITES or shaping the subtle evolution of its approach nor were they involved in drafting MAC standards; moreover, the government had minimal input into the live reef food fish trade standards.

CONCLUSION

With the three schemes investigated here, there is a certain type of collective hegemony associated with having multiple but different policy approaches covering experts of reef organisms being promoted simultaneously. The overall effect of CITES' focus on Fiji's coral trade, MAC's certification project, and the efforts to include Pacific Islands in global standards for the live reef food fish trade has been to deny Fiji Islanders the opportunity to design their own policies concerning the harvest and export of coral reef organisms, and its environmental impacts. This has happened because all three initiatives

treat the environmental terms of trade as a technical rather than a political issue, denying Pacific Islanders the right to participate in setting those terms. I explore this further in the next (penultimate) chapter, which reviews the various examples of hegemony revealed up to this point.

Part IV

Findings

Chapter Thirteen

The Hegemony of International Coral Reef Policy

Introduction

This penultimate chapter returns to the two-fold aim of the thesis, (1) to examine how environmental policy arises as an instrument of international governance, opening up space for seeing environmental crises as political assemblies; and—the primary aim— (2) to investigate whether the transfer to developing countries of Western environmental policy ideas may be a form of hegemonic control. Addresses these in turn, the chapter pulls together the picture of international coral reef policy that has unfolded through the interrogation of various policy situations and texts in previous chapters. The first section describes how, through socio-political interactions across space, international coral reef policy arises as an instrument of governance. The second section summarises the hegemonic nature of coral reef policy ideas transferred to the Fiji Islands and the policy practices used to enrol those islands.

The questions listed in Table 5 at the end of Chapter Three were designed as an indirect way of teasing out elements of this aim. Previous chapters have largely answered these questions and this chapter completes that process. It does not, however, go through each question in turn as that would mean repeating material covered in previous chapters. Rather, this chapter concentrates on addressing the aim itself.

How Policy Arises as an Instrument of Governance (Aim 1)

To understand how coral reef policy arises as an instrument of international governance, a focus on policy prescriptions is too restrictive. We also need to understand the role that discourse (knowledge/power systems) and universals play. In previous chapters I illustrated how a discourse—the global environmental policy discourse described in Chapter Two—depicts international policy as a cooperative, politically neutral venture employing scientific and technical means to address global environmental problems. The account in Chapter Five of the growth of international concern

about coral reefs reflected that discourse. The case studies of policy connecting with the Fiji Islands, analysed in Chapters Eleven and Twelve, illustrated how various groups' policy practices accorded with the discourse. The analysis of common metaphors and storylines in Chapter Eight showed how key elements of the discourse exist in texts espousing policy for coral reefs around the world.

CRITIQUING INTERNATIONAL CORAL REEF POLICY

The highly orthodox and technocratic character of the field of international coral reef policy is borne out by my experiences at the International Coral Reef Symposium, a gathering of 1400 experts in Okinawa at the end of June 2004. Of those to whom I chatted over the course of the week, only one came close to understanding the nature of my research. The pervasiveness of the uncritical orthodoxy is borne out by the difficulty I had in finding a slot for the paper I wished to present. Titled "The (dis)connection between international assessments of the state of coral reefs and local policymaking: a Fijian case study", the paper covered the same ground as the second half of Chapter Ten. In essence, it suggested that in looking for reasons why ICRI and GCRMN had not been successful in influencing government policy in the Pacific, one should analyse the international coordination, not just lay the blame on a lack of local capacity and political will. In concluding it, I argued that if ICRI and GCRMN are to avoid future charges that they merely benefit those who coordinate and fund their global coordination, then they must consciously give as much attention to forging connections between local monitoring and local policy as they have given to those between their networks' global coordination and policy processes at international level. Yet, in the detailed programme design, divided into 5 themes and 58 (sub-theme) topics, there was no place for such a presentation. In the end, I arranged to present it in a session titled, "Critical appraisal of local, customary, participatory and co-management"; there was simply no slot in symposium's programme for critically appraising international policy efforts.

At morning tea following the presentation, the session's chair Professor Nick Polunin, who was president of the International Coral Reef Society and whose work I introduced in Chapter Eight, gave me another example of the disconnection of which I had spoken. He said his University of Newcastle upon Tyne research group had failed to pass onto the Fiji Fisheries Division the results of their extensive fisheries management research programme in Lau, because they had not been funded to do so.

ENVIRONMENTAL POLICY DISCOURSE: EXTERNALISING THE POLITICAL

Making the political apparent; counter-reading coral reef policy

It is difficult to step outside the 'orthodox' version of the discourse and see its political content. So omnipresent is the conceptualisation of the environment as a problem, pervading mainstream, populist and critical environmental thought, that it is difficult to perceive of it as anything else. Furthermore, the view of science as advancing knowledge in a politically neutral way combines with the strength of the

moral campaign to save the planet, making it difficult to see this discourse as politically motivated. Even analysing how power is being exercised within the outwardly cooperative framework of international environmental policy is challenging because that exercise is disguised not only by the idea that environmental policy is a technical matter but also by its interweaving with development. In the Fiji Islands, environmental and development agendas have become enmeshed through the concept of sustainable development. Many see development as something desirable, an entitlement even. As a consequence, officials, politicians, community leaders and NGO staff generally favour participating in environmental policy projects. This notion of consent freely given disguises how power is being exercised across space.

In studying international coral reef policy, I overcame this difficulty by using different analytical perspectives (described in Chapter Four) to make the political nature of the discourse visible and show political assembly around the concept of an ecological crisis facing coral reefs. I have highlighted that which modern thought has rendered largely invisible—the political nature of international environmental policy. As well as the influence of discourse, the counter-reading of coral reef policy (Chapter Six onwards) uncovered both the political operations that have permitted the discourse's formation and the operations exercised by different 'discoursing' subjects. This counter-reading examined modes of power being exercised, interests, technical practices of experts and appeals to the universal, demonstrating how a global politics is being built around the project of saving coral reefs.

As well as being enabled and constrained by knowledge/power systems, policy operates through universals, in the manner discussed in Chapter Four. The remainder of this first section looks further at how, through universals, policy crosses cultures, at the central role experts play in this, and then specifically at how international coral reef policy crosses space by forging with the Fiji Islands connections that give grip to those universals.

POLICY CROSSING CULTURES: THE ROLE OF UNIVERSALS

The nature of universals in coral reef policy matters

Universal aspirations and universalised knowledge, extended from the local to the global, underlie the construction of coral reef problems as global. They assign blame for these problems and identify expertise for designing and effecting solutions. International coral reef policy derives many of its universal aspirations from a particular set of eco-politics, from science and from capitalism. These universals, described below, reflect the global environmental policy discourse, again indicating how this discourse pervades the international coral reef policy arena.

The universal common to all contemporary eco-philosophies and eco-politics is that of environmental concern and responsibility, the moral imperative to look after the planet (Chapter Two). Allied to this are science-based universals positioning the environment, in this case coral reefs, as a global problem. Scientific experts have described coral reefs as a phenomenon, a universal type of nature found in the band of tropical and subtropical regions girdling the globe. Taxonomy distinguishes and categorises the multitude of families, genera and species while biogeography discerns patterns in their distribution. All are universalised into the category of coral reef ecosystems, distinguished from cold-water coral reefs

and (non-reefal) coral communities. Gathered together, coral reef ecosystems have been specified, in the discursive, metaphorical manner described in Chapters Six and Eight, as a global problem requiring global solutions. Causes of coral reef degradation have been standardised to certain universal categories summarised in Table 7. These categories reflect not local biogeography, history, culture or politics but a universal progression from natural to degraded, with phase shifts along the way.

Amongst coral reef scientists, knowledge is accumulated in order to specify an ideal state for coral reefs and to attribute shifts away from that ideal state to particular human actions. For these experts, the notion of some ideal, natural state is aesthetically alluring; vistas of living coral in vibrant colours and diverse shapes, numerous large predatory fish lurking, and shoals of tiny grazing ones darting and hovering around the corals, reef sharks and turtles cruising above—this is the idyll they seek. Acres of dead coral covered with lush meadows of fleshy algae are badly tolerated. Flats of coral rubble pecked over by parrotfish are considered hellish. In fact, the least disturbance to live corals, the better. This is an example of what Dalby (2004 p. 8) calls an aesthetic environmental trope of pristine nature, a trope that suggests the importance of minimising alterations to habitats.

As science spells out the problems facing coral reefs, the universal form judges those problems as being of common concern to all humanity rather than as a product of a particular culture that understands its reality in such terms. Thus, the problematisation of coral reefs as globally degraded relies not only on Nature as a set of universal, orderly and inspiring laws, but on science as being outside culture. This is the citadel phenomenon discussed in Chapter Four.

Faith: its manifestations

ICRI's strategy manifests a faith in science and instrumental rationality, seen in the operations described in Chapters Six to Twelve. In rising concerns about the extent of coral reef degradation worldwide, the key investigative tool used to identify, monitor, research and document that degradation has been science. WWF's search for the root causes of biodiversity loss exhibits similar faith in the ability of science to identify environmental problems. In efforts to address coral reef degradation summarised in Chapters Six, Eight and (in relation to Fiji Islands) Ten to Twelve, there are further expressions of this faith in science as an appropriate and effective way of addressing coral reefs degradation—scientifically based approaches to improve reef resilience, quota-setting for exports, scientifically-based ecoregion conservation plans. Furthermore, the belief that scientific knowledge, if communicated, will help save coral reefs by putting society onto an ecological sustainable footing can be seen in the GCRMN philosophy and texts, in Reef Check and ReefBase, in the World Bank's capacity-building efforts, in the scientific tourism of Greenforce and Coral Cay, in WWF's diverse efforts, and in FLMMA's work.

Faith in the practices of instrumental rationality—in the efficacy of conscious reasoning and planning of action to define the means of achieving particular ends with anticipated consequences—also permeates international coral reef policy endeavours. It underpins the capacity-building philosophy propounded by GRCMN and ICRI and features in the texts of the CBD and CITES. The search for rational policy solutions, efficacious means to save coral reefs, spawned the plans of ICRI, ITMEMS and USCRTF, as well as various regional ICRI strategies. WWF's ecoregion planning processes

provide further examples, as do MAC's management plans and the process of forming LRFFT global standards.

Those who depict the degradation of coral reefs as a global problem, in order to mobilise people to address that degradation, are exhibiting not only faith in experts and the practices of science and instrumental rationality, but also in the practice of working together across national boundaries. As Tsing (2005 p. 89) points out, collaboration is another universal; it constructs universals that would not otherwise exist. Here, Tsing uses collaboration as a near-synonym for cooperation, while recognising that collaborators may not be working towards the same ends. But the mere act of collaboration, suggests at least one shared goal or it would never come about.

The modes of international interaction that Miller (2001 p. 170, discussed earlier in Chapter Three) describes as characterising post-war science and technology—intergovernmental harmonisation, technical assistance and international coordination of scientific research—are examples of universals exhibiting faith in working together across national boundaries. These typify ICRI's approach to science. This faith in international cooperation is not confined to science; it is also seen in the universals of capitalism. Global connections upon which capitalism depends are forged through policy controlling environmental terms of trade in coral reef organisms and live rock—the efforts of CITES, MAC, TNC and others. The previous chapter described how the introduction of particular policy prescriptions fro this trade depends on certain groups and agencies in the Fiji Islands cooperating with those agencies seeking to have their policies adopted. Some, but not all, of those prescriptions are neoliberal.

The universalising politics of neoliberalism and logic of the market help draw Fiji's reefs into the global: MAC's certification scheme, generalised enough to cover any and all countries, and the LRRFT global standards. The scientific tourism ventures of Coral Cay and Greenforce operated out of Britain, are part of this universalising logic of neoliberalism, seeking alternative, sustainable livelihoods for communities in developing countries: ecotourism blended with the technical practices of science in a new regime of capitalist investment and accumulation. These neoliberal prescriptions all depend upon international collaboration to design, then institutionalise their policy prescriptions in developing countries. The logic of the market does not achieve this institutionalisation, it merely serves to keep the schemes operating once put in place.

ICRI's strategy, as well as that of the USCRTF, of CRISP, and of various NGOs whose mission is to save coral reefs, exhibits another faith—the belief that controlling nature is both desirable and feasible; this requires a concomitant faith in experts' ability to control nature. Conservation endeavours exhibit such faith.

Conservation is a universal aspiration to save a Nature seen as needing to be rescued, to manage natural resources in a way that maintains biodiversity. Western notions of conservation cross cultures through their own collaboration with development, an example of which, FLMMA, was described in Chapter Eleven. In this collaboration, conservation draws on the metaphors of globalism and modernisation. The metaphor of globalism sees development as an inevitable, beneficial process for the 'developing world', which can be quickened by increasing 'aid' and 'technical assistance' from those already

'developed'. Thus conservation also draws on the teleological notion of development process found in modernisation theory; the universal aspiration of development helps environmental and conservation policy cross cultures; it helps connect the Fiji Islands into international coral reef policy (Chapter Ten).

As a universal aspiration, development relies on the universal of cooperation. On the one hand, this aspiration of development encourages Fiji Islanders to participate in schemes designed to put trade onto an environmentally sustainable footing, so that the trade may facilitate development of the communities collecting those organisms (Chapter Twelve). On the other hand, the same aspiration connects into FLMMA's aspirations to help communities modernise without selling their reef organisms (Chapter Eleven). This is the versatility of development, an ill-defined but alluring aspiration.

POLICY CROSSING SPACE AND FORGING CONNECTIONS: THE EXPERT'S ROLE

While in some other appearances, global Nature facilitates formal international governance regimes, here it facilitates the expert intervention of coral reef scientists networking across the globe, identifying problems, offering policy prescriptions and technical assistance. In this appearance, those with the skills and knowledge to save reefs are the experts, the heroes of the story. They have the expertise to solve the problems thrown up by modernisation and therefore (in their view) are legitimately able to legislate for the whole of society, both human and non-human.

The storylines of international coral reef policy are peppered with experts including those identifying biodiversity hotspots and establishing global biodiversity conservation priorities (e.g. the Global 200); designers of policy solutions such as MAC's scheme and the global standards for the live reef food fish trade; experts in community participatory analysis; and locally-managed marine area specialists. A person can achieve the authority of an expert by (being seen to be) the designer and executor of modes of classification and surveillance, common modes of power exercised in modern society. Thus we have experts in assessing the state of coral reefs worldwide: those designing and running GCRMN, ReefBase, Reef Check, and WRI's *Reefs at Risk* exercises. We have experts in communicating science to the world of policy: those selling ICRI's message to MEAs and to the media, and those writing the overview chapters of the GCRMN global status reports directed at policymakers around the world.

Experts identify the problems facing coral reefs, assess their extent, design policy technologies to address these problems, inform various governmental and intergovernmental organisations about those problems, endeavouring to get them to adopt particular policies and policy technologies. Some experts produce expert text books and scientific papers reporting on the state of the environment and advising what should be done, Some design policy technologies and advise on their implementation; some test the effectiveness of different approaches. Expert-produced texts then serve as the basis for policy documents and for media reports. Furthermore, experts take their technologies to various developing countries, setting up projects, and co-opting local experts to institutionalise them. Other experts arrange funding and manage projects for funders such as philanthropic institutions and aid agencies.

In analysing how the crisis narrative has deliberately been constructed, Chapter Six interpreted those scientific experts espousing a crisis not as objective, politically-neutral identifiers of environmental

problems, but as people setting out to create a political assembly around the notion of a crisis facing coral reefs. In the fluid connections between science and politics on the stage of international environmental policy, the authority of science is a resource upon which experts can draw. Those who inhabit the zone of science/policy hybridisation bring the authority of science into policy. In constructing a crisis narrative, Wilkinson and other experts used a rhetorical device derived from the intellectual design of science to blend science and policy-talk. They then used that narrative to underpin particular policy approaches seen by themselves as politically suitable.

Particular styles of rhetoric used to cross cultures

The rhetorical device that enables science/policy experts to draw from both science and policy with ease is science's rhetorical style. This style, commonly found in published scientific papers particularly in natural science, derives from science as an impersonal, abstracted, agent-absent discourse making factual claims of universal applicability regardless of human action and belief. This rhetorical design enables environmental scientists to extend their scientific role to include that of environmental policy advocacy and policymaking; it helps science/ policy cross cultures.

This technical, outside-of-culture style is tailored to suit the specific needs of scientists doing the work of generating universally true knowledge-claims. Environmental scientists have employed this design to generate 'universally-true' problem framings of environmental policy issues and 'universally-true' policy solutions 'needed'. They have been aided in this by the utility of science in constructing a model of the general rather than the particular.

As a strategic argumentative resource, technical discourse is part of the range of resources available to scientists, one of the forms in which scientists can choose to describe either their own work or that of other scientists (Locke, p. 12-13). Scientists could, instead, choose to employ rhetoric which is personalised, localised and agent-centred, making factual claims that are particular to specific human actions and beliefs (Locke 2001 p. 13). However, scientific rhetoric, with its technical, impersonal and asocial characteristics, is tailored to suit the specific needs of scientists working on environmental policy matters (Locke 2001 p. 13). It is a useful resource. Both coral reef and conservation scientists have readily adapted its impersonal style to become authorities on coral reef and conservation policy. Moreover, using the rhetorical style of scientific discourse helps both scientists and science/policy experts resist the potential charge of serving some personal or social interests (as Locke 2001 p. 14 observed). But science never completely escapes that charge because of the dilemma around which its intellectual framework is organised—a dilemma between the universality of knowledge claims and the particularity of their production (Locke 2001 p. 13). Chapter Six summarises a debate about natural recovery rates that illustrates this.

Other resources that science brings to science/policy are the devices which give science a global reach, especially journals and international conferences—a form of 'virtual witnessing' that allows scientific knowledge to be globalised and hence perceived as rational, universal and modern (an insight from actor-network theory summarised in Keeley and Scoones 2003 p. 27). In the political assembly around the imagined coral reef crisis, several (rather than one or two) journals have played a key role. They

include not only scientific ones such as *Coral Reefs*, *Nature*, *Science*, and *American Zoologist*, but also ones more ostensibly conservation-oriented such as *Conservation Ecology* and *Conservation Biology*.

Coral reef science/policy experts use different argumentative resources to suit particular target audiences. In connecting ICRI with MEAs, coral reef experts have used the rhetorical device of diplomatic statements. The *Call to Action* mimics an environmental treaty and subsequent statements prepared for MEAs mimic the statements produced by intergovernmental meetings of appointed representatives.

Experts' practices and prescriptions: forging connections

Just as international policy is the realm and language of experts, so expert policy technologies and expert practices forge global connections, engaging the universals of policy. Their reach—networks, international bureaucracies, international conferences, publications, capacity-building projects and conservation initiatives—gives grip to global aspirations. Thus policies travel over space not as harbingers of objectively-proven truth as technologies of power (as Peet 2001 described).

International coral reef policy—the policy being disseminated to developing countries—arises in multiple sites in various ways. Small groups of people have deliberately created policy statements in tandem with international meetings they have organised (the *Call to Action* and other statements listed in Chapter Seven). They have used the brand of ICRI to add authority to statements written specifically for presentation at international meetings (at WSSD and various MEA meetings). The GCRMN gives rise to policy through different mechanisms. In the process of requesting national reports on the state of reefs, then combining these into a global report, GCRMN coordinators create and shape policy in two ways: obliquely through the standard format they specify for each national and regional report, and explicitly through the executive summary they draft and place in the front of each biennial publication.

In addition to these mechanisms, coral reef scientists have endeavoured to create policy through the device of scientific papers. From Wilkinson in 1992 to Bellwood *et al.* in 2004 and many in between, scientists have published papers in scientific journals arguing the case for certain policy approaches to saving the world's coral reefs. MAC and a small group of other US-based NGOs, prompted and assisted by WWF-US's macroeconomics policy unit, have used the device of international development-style projects to create neoliberal policy for the control of environmental terms of trade for the marine ornamentals and live reef food fish trade. Other mechanisms designed to create policy are described in Chapter Seven, from the CBD's expert consultation, to WWF's ecoregion planning. The range of efforts is diverse, yet the policy being created has a certain sameness, based around much the same standard prescriptions.

Coral reef policy experts advocate standard policy prescriptions as normative paths to maintain a certain vision of a natural world of healthy coral reefs; they also advocate them to effect change amongst the human population deemed necessary to maintain that aesthetic. These prescriptions include the importance of assessing the state of the coral reefs worldwide to identify the extent of degradation; stopping extraction and degradation in certain areas designed to act as both standards of naturalness and reservoirs of larvae; plus further research into causes of degradation and solutions.

Experts argue for either human population control and/or alternative livelihoods that do not destroy reefs but use those resources sustainably. They advocate transforming communities into rational planners and resource managers, and the transformation of the state into a modern environmental one with the political will to implement modern environmental management. At the same time they suggest the state should attach increased importance to market dynamics and economic agents.

The standardness of the prescriptions is one of the factors giving international coral reef policy a coherence despite the diverse sites from which it is arising. The fact that these prescriptions are presented as part of a universalised problematic is another factor, as is the practice of glossing over site differences (e.g. between the Lau Islands and Jamaica, as discussed in Chapter Eight). The ICRI and GCRMN brands also serve to unify various endeavours.

Policy technologies: lengthening the network

Actor network theorists see the global reach of organisations such as bureaucracies and corporations as depending upon "intricate interweavings of situated people, artefacts, codes, and living things and the maintenance of particular tapestries of connections across the world" (Whatmore and Thorne 2004 p. 236). This resonates with the actions of ICRI members enrolling people and reefs around the world, lengthening their networks. According to actor network theory, network lengthening requires the mobilisation of larger numbers and more intricately interwoven constituents or mediators to sustain a web of connections over greater distances (Whatmore and Thorne 2004 p. 238). Latour (1993 p. 117-122) showed that as the network lengthens, the significance of technological agents increases: money, telephones, computers as objects that "encode and stabilise particular socio-technological capacities" and sustain patterns of connectivity that "allow us to pass with continuity not only from the local to the global but also from the human to the nonhuman".

When the originators of a global network want to increase the network's reach, policy technologies are as important as socio-technologies. WWF's ecoregion planning processes, GRCMN's preparation of nation status reports on coral reefs, CITES collection of expert statistics and setting on quotas, and MAC's certification process have all helped lengthen the network assembled around the coral reef crisis.

FORGING CONNECTIONS WITH THE FIJI ISLANDS

The international players

A diverse group of overseas agencies connect with the Fiji Islands on coral reef policy matters. The long list of those concerned with the environmental terms of trade on coral reef organisms, detailed in Chapter Twelve, illustrates that diversity. Add to this various agencies working on conservation and community resource management projects (only some of which are discussed in Chapter Eleven), plus agencies involved in assessing the state of reefs (listed in Chapter Eight) and researchers from overseas universities and research organisations (including but by no means limited to the University of Newcastle upon Tyne researchers mentioned in that chapter). There are also agencies involved in funding or preparing reports on matters which touch on coral reefs in some way, such as climate

change (mentioned in Chapter Ten), biodiversity (mentioned in Chapter Nine), and general fisheries management (also Chapter Nine).

The categorisation into state, IGO or NGO of groups endeavouring to enrol the Fiji Islands in international coral reef policy does not reflect the diversity of governance structures revealed in the various *Introducing the Players* text boxes. Nor does it accommodate the structure of organisations such as ICRI, GCRMN, IUCN, WorldFish Centre and TRAFFIC. Furthermore, the NGO nomenclature disguises the variety amongst agencies so called. How can one compare the structures and governance of WWF, TRAFFIC, Reef Check, FoS, and MAC? To understand these organisations, we need, at a minimum, to look at their governance structure and the way, through this structure, they link other agencies, firms, states and NGOs; also at their sources of funding; at the way in which they conduct overseas operations; their mission and policies; their history and that of their key staff, particularly any other agencies with which those staff have been closely associated in the past.

The network character of connections

The place in which those organisations connecting with the Fiji Islands are headquartered is significant. Despite their diversity, the various organisations are either Pacific-based, or are headquartered in the developed, industrialised regions of the world, in various European, North American, and Australasian countries—with the exception of UNEP and even that agency moved its coral reef unit from Nairobi to Cambridge, England. In this regard, the notion of a centre-periphery model of international policy is accurate. It is inaccurate, however, in considering the Fiji Islands as a part of a resistant margin, fighting for independence (a general inadequacy of this model identified in Chapter Four). Although Islanders appear to be socialised to some degree, into cooperating in international environmental policy endeavours, they are neither passive recipients of discourse, nor are they willing dupes. The agency of local experts working in the field of environmental policy is the same agency as experts operating in the international sphere of policy. Local experts co-opt storylines to suit local situations and advance local interests. In the Fiji Islands, the various groups of people adjusting storylines about coral reefs and coastal conservation to suit their own political purposes include those working for NGOs and the regional university, state officials and government politicians.

Furthermore, in matters of coral reef policy, there does not seem to be any sustained regional Pacific centre of persuasion, in the sense Peet (2001) envisages, a geographically located organisation linking the universal and the local, "centres... with their own interpretive instructors, [which] have locally-constituted institutional complexes of projecting modified hegemonic discourses into regional practice... formative and translating centres of persuasion and influence, linked by flows of discourse". Many links go directly from headquarters in a developed country to the Fiji Islands, rather than being routed through a regional organisation that links the universal and the local, and around which specific regional discursive formations coalesce,

Yet, within the Fiji Islands, Suva plays a central role and displays some elements of Peet's concept of a regional hub. At the same time, it is a place locked into a multitude of relational networks of varying geographical reach akin to Amin's distinctive nodal formation, discussed in Chapter Four. Even so, Suva lacks a single distinctive organisational 'centre of regional persuasion' on matters of

environmental management and policy. Almost invariably however, foreign ideas about environmental management entering the archipelago's boundaries coalesce in Suva. The city links to world cities where institutional complexes produce the discursive policy formations that influence environmental policy around the world. Suva is the South Pacific hub ('nodal formation') for both environmental and development policy, linked to smaller hubs in Apia and Nouméa. It is a place where projects are headquartered and NGO sub-offices established. USP (the regional university) is based there; almost all regional Pacific intergovernmental agencies have either headquarters or sub-offices in the city. There, overseas agencies make contact with state departments, workshops are held, a vibrant media reports daily on such occurrences, national laws are made, libraries operate, where the country's telecommunications to the outside world are kept operating.

While SPREP fills the role of a regional centre of persuasion and influence for international environmental matters generally, that agency has only been involved in coral reef policy on the few occasions discussed in Chapters Seven and Eleven. Neither ICRI, GCRMN, the US government or any other major player in international coral reef policy have funded SPREP sufficiently for it to sustain the role of a regional centre of persuasion and influence. The same applies to USP's IMR and Marine Studies Programme; although they have operated as a GCRMN node and they provide logistical support and legitimacy to overseas researchers such as those from the University of Newcastle upon Tyne, a lack of sustained funding has impeded them becoming a hegemonic regional link between the global and the local. Similarly, although SPC's marine division has shown some interest in coral reef fisheries (the live reef food fish trade; aquaculture or enhancement of species such as *trochus* and giant clams; reef fishery surveys), it too has been unable to sustain the role as a regional 'centre of persuasion and influence' because of a lack of funding for fulltime 'interpretive instructors'. This may, however, be changing, now France is funding a ReefBase office in Nouméa and directing the CRISP project described in Chapter Seven.

A relational model, in the sense described by Massey, Amin and Allen and summarised in Chapter Four, allows the network character of relationships—Latour's careful plaiting of weak ties—to become visible—not only ICRI's networking efforts described in Chapter Seven but also the networking in Chapters Eleven and Twelve. A relational model allows those agencies that dominate by virtue of the number of connections they have forged to become visible as hegemons. Thus, we can recognise WWF as utilising multiple connections and creating opportunities to influence both government and community policy. CITES might be termed successful in influencing policy by virtue of the changes in legislation and the organisation of border regulation, which it forced upon the Fiji Government. But CITES has not established the extensive network of links with which WWF connects the Fiji Islands to the international. In forging these connections and shaping local coral reef policy, WWF has, according to this criterion, been dominant among the agencies endeavouring to shape coral reef policy in these islands.

Although the coral reef crisis is reaching the Fiji Islands, principally through written documents such as GCRMN global status reports and scientific journals, these have a limited distribution centred on USP. In contrast, ideas about an environmental crisis and the need for sustainable development have much

wider distribution in the Fiji Islands. Fiji Islanders are rallying around the imaginary of an environmental crisis rather than that of a coral reef crisis. Moreover, foreign agencies tend to rally Fiji Islanders around the former rather than the latter.

Processes by which global connections are forged are described in Chapters Six to Eight and, specifically in relation to the Fiji Islands, Chapters Ten to Twelve. None of these descriptions resemble the ideal-type descriptions of policy processes, encapsulated in the standard models and accounts of environmental regimes, which produce policy through democratic participation and rational deliberations (Chapter Two). For policy connecting with the Fiji Islands, there are two important points of difference, described below.

The coral reef problematic: solutions preceding problems

First, the identification of problems does not necessarily precede the selection of policy solution. To the contrary, none of the practices conducted in the name of saving Fiji's coral reefs, described in the last three chapters, have entailed the clear, sequential linear relationship between recognising problems and finding policy solutions postulated by the rational model of planning. In each case, efforts to identify problems came after, not before, the basic policy approach had already been selected. For example, in the two coral reef conservation initiatives discussed in Chapter Eleven, ecoregion planning and community conservation were pre-decided strategies. Furthermore, Chapter Twelve showed how a policy solution is pre-selected, then 'transferred' to the Fiji Islands, with little or no preceding characterisation or quantification of the nature and extent of the local problem being caused by exporting coral reef organisms.

This suggests predetermined solutions, indicating that Fiji's reefs are constructed as problems not to find suitable solutions to those problems but to position those who use and manage Fijian reefs in such a way that, in the glare of international focus on environmental issues, they are predisposed to cooperate in the policy solutions being advanced for their reefs. Fiji reefs are enrolled into the global problematic specifically to bring those reefs, and those concerned about their use, into the political assembly around the notion of a coral reef crisis.

Including Fiji reefs in the global problematic: politics not science

Through data-gathering projects and scientific papers reporting research, the Fiji Islands is deliberately being re-imagined as a site of degraded coral reefs. Along with other countries where reefs occur, the archipelago is being drawn into the coral reef crisis made problematic through expert practices. These practices include that used in the GCRMN process of compiling global status reports, which produced descriptions of the problems facing Fiji's reefs from anecdotes, snippets of data and beliefs, all compiled according to a standard format. CITES and WCMC use expert practices to keep track of, and publicise trends in, the global trade in organisms considered at risk; in doing so, they generate statistics that help enrol Fiji reefs. This enrolment is aided by the expert practices associated with publishing scientific work (described in Chapter Eight): not just the construction of arguments around data fashioned into an argument judged worthy of publication but also the accompanying press releases designed to publicise the work and bring it to international attention, thus increasing the research's

prestige. Through such practices, the Fiji Islands is cast as one of suite of developing nations where fishing is causing the depletion of reefs and the state is inadequately managing coral reef fisheries.

The data

Although specific studies at some overseas sites do show evidence of long-term change in the composition of coral reefs (as Connell (1997) found in his review reported in Chapter Six), the notion of long-term, unidirectional change on a global scale, a potential slide into extinction, is conjectural rather than proven from data gathered from around the world. It appears that, in the absence of accurate or reliable data, scientists are prepared to use crude efforts to produce global-scale data; furthermore, scientific journals are prepared to publish those efforts.

Contrary to first appearances portrayed by the technical and impersonal style of scientific rhetoric, data underlying the identification of Fiji coral reefs as part of a worldwide phenomenon of coral reef degradation are scarce. Even the GRCMN national status reports (Chapter Eight) have little basis in survey and monitoring data as opposed to anecdotes and generalisations. Many of the scientific assessments and statistics used to justify Fiji reefs being part of the global problematic do not reach the standard for survey and monitoring taught in quantitative courses on marine ecology in New Zealand and at USP in Suva (and presumably also in America and Europe). Work of this standard, conducted in the Lau group, has yet to be incorporated into GCRMN reports of the status of Fiji's reefs (see Dulvy *et al.* 2002; Dulvy *et al.* 2004). Moreover, the authors' claim of repeated phase shifts has yet to be analysed in terms of evidence for global degradation of coral reefs.

Moreover, policy solutions being advocated on the basis of scientific data appear on closer inspection to have little basis in data. Only the skimpiest of scientific assessment is used to justify the environmental controls being proffered to control the export of reef organisms from the Fiji Islands. The initiatives targeting the export trade in Fijian reef organisms (Chapter Twelve) represent Fiji's reefs as being overharvested, without being explicit about which reefs and to what extent. CITES Secretariat staff used inaccurate data to justify their efforts to get the Fijian state to apply the rules of the convention, and did so without any monitoring data about the environmental effects (on reefs) of the harvest of reef organisms for export. In justifying their scheme, MAC staff had some surveys of live rock supplies in and adjacent to areas being harvested, plus some quick surveys of sites from which fish and corals were being collected. They did not, however, have any long-term studies of effects of harvesting. Despite the almost complete absence of any scientific studies specifically designed to investigate the impact of harvesting for export on Fiji's coral reefs in a scientifically rigorous manner, both CITES and MAC staff proceeded as if existing levels of harvest were a proven problem.

There are technical and economic reasons for this lack of data. In marine science, it is difficult, complex, physically demanding and expensive to obtain time-series of data that demonstrates cause and effect (Kenchington 1990). Experimental designs and statistical techniques needed to 'prove' cause and effect are complicated and must be carefully matched to the situation. Before/After Control/Impact studies are a lengthy and time consuming process, requiring surveys before any impact (e.g. harvesting) occurs, as well as afterwards, plus spatial controls at sites not being impact/harvested, randomised in

time. Science does not provide a cheap and effective way of ascertaining all the effects that fishing or other anthropogenic activities may have upon reefs. Reef Check's efforts illustrate this—hundreds of volunteer hours over several years has produced global-scale data for few species (Chapter Five).

Getting accurate time-series data showing, on a global scale, the extent of coral reefs degradation plus trends over time, is not something that reef scientists can yet begin to contemplate. Even the extent of reefs worldwide is still being mapped. The *World Atlas of Coral Reefs* (Spalding *et al.* 2001) was a first attempt using existing data, upon which the NASA-funded *Millennium Coral Reef Project* is currently improving, by mapping and classifying reefs using data from space (Andréfouet 2004).

The logic

The logic by which Fiji reefs have been constructed as sites with environmental problems is based upon the assumption that Fiji reefs are likely to be facing the same problems described in some other parts of the world. There is a presumption that what has happened in Southeast Asia (the 'serious degradation of many reefs' and their 'inexorable decline' described in Wilkinson, 2000 p. 10, 118) will eventually happen in other areas such as the Pacific, given time, as population levels increase—unless of course certain steps are taken to avoid this. Yet, nowhere in predictions of a continued decline for reefs, is there any analysis of actual densities of people per reef area in different regions, or of population trends.

Simple analysis, undertaken below, suggests this presumption is unreasonable; it is not the logic of rational science. As Table 22 shows, the area of reef per person is much greater in most Pacific Islands, including the Fiji Islands, than in Southeast Asia. Moreover, population density per unit of reef area is not in itself sufficient to indicate where overfishing might occur. One might expect that on the island of Tarawa in Kiribati (northern Pacific), the reefs would be overfished because it is one of the most densely populated Pacific islands, yet its reef fish populations are relatively healthy because many fish are ciguatoxic and therefore not fished (Cameron Hay, ex-IMR director, USP, Suva, *pers. comm.*).

TABLE 22: RATIO OF REEF AREA TO POPULATION FOR THE CORAL REEFS OF PACIFIC ISLANDS

Island group	Reef area (km^2)	Population (000s)	Ratio reef/thousands of population
Southeast Asia excluding China (PRC)	89,150	674,918??	0.13
Islands in the Caribbean	12,510	32,778	0.38
Australia	48,960	19,165	2.6
Pacific Islands			
Hawai'i	1,180	2,020	0.6
Northern Marianas	<50	72	>0.7
Guam	220	155	1.4
Samoa	490	179	2.7
Papua New Guinea	13,840	4,927	2.8
American Samoa	220	65	3.4
Nauru	<50	12	>4.2
Fiji Islands	**10,020**	**832**	**12.0**
Solomon Islands	5,750	466	12.3
Tonga	1,500	102	14.7
Vanuatu	4,110	190	21.6
French Polynesia	6,000	249	24.1
Tokelau	<50	2	>25.0
New Caledonia	5,980	202	29.6
Kiribati	2,940	92	32.0
Federated States of Micronesia	4,340	133	32.6
Cook Islands	1,120	20	56.0
Palau	1,150	19	60.5
Wallis and Futuna	940	15	62.7
Tuvalu	710	11	64.6
Niue	170	2	85.0
Marshall Islands	6,110	68	89.9
Pitcairn Islands	<100	c. 50 people	>20,000
Johnston Island	220	0	[*meaningless*]
TOTAL for Pacific Islands	**<67,260**		

Source: (Spalding *et al.* 2001) amended according to Spalding *pers. comm.* (October 2003) re 'correct' figures for Palau and Federated States of Micronesia—in the first print runs of the *Atlas* some Palau reefs were incorrectly assigned to Federated States of Micronesia.

In the Fiji Islands, population pressure is relatively low. There are 12 kilometres of reef for every thousand Fijian inhabitants compared to 0.13 kilometres in Southeast Asia and 0.38 kilometres for islands in the Caribbean (based on statistics in Spalding *et al.* 2001). Thus Wilkinson's statement in the executive summary of the 2000 GCRMN global status report that "unless these [major human] threats

are managed and mitigated, reefs will continue to degrade with the inexorable increase in human populations and pressures" seems less relevant to the Fiji Islands (Wilkinson 2000 p. 18). That executive summary contains the assumption that, unless large marine protected areas are established, we will see in places like the Fiji archipelago, the sorts of changes that have occurred on reefs in Southeast Asia and the Caribbean (ibid). Yet the types and levels of human activities are not the same in all locales; just as they have different histories, they will not necessarily share the same future.

Furthermore, it is odd that claims of phase shifts on Fiji reefs come from work in areas deliberately chosen because it is remote from commercial fishing and industrial development (the Lau Islands), while phase shifts in the Caribbean are linked to commercial fishing (especially of urchins) and sewage pollution (Chapter Five and Eight). One has to question whether these reported phase shifts are part of the same phenomenon. Are the subsistence fishing-related phase shifts reported from Lau (Chapter Eight) the same phenomenon as that reported from 'severely overfished' and polluted Caribbean (Chapter Five)? For that claim is implicit in descriptions of worldwide coral reef degradation.

These two examples show how the logic of the GCRMN is not that of supposedly objective science but that of politics (i.e. of ICRI's *Call to Action*). This logic creates situations for expert intervention through the imperatives of precaution (preventing damage before it is too late) and uncertain knowledge (are there already significant changes on Fiji reefs as yet unstudied and unreported?). CITES' use of data, discussed in the previous chapter, is similarly precautionary. At the 10th International Coral Reef Symposium in Okinawa in 2004, I encountered another such situation (below).

Interpreting the Sloppy Use of Statistics

One of the sessions I attended at the 10th International Coral Reef Symposium, held in Okinawa in 2004, concerned the marine aquarium trade. The session was co-ordinated by American coral reef ecologists Andy Bruckner (NOAA) and Eric Borneman. Both had been involved in compiling data on the coral trade for the USCRTF's investigations (Chapter Twelve described how those investigations influenced expert control on Fiji's coral trade). Bruckner has also published numerous articles about the trade. Having time on his hands when a presenter did not show, Bruckner decided to present a case study about the trade. With a Powerpoint presentation already on his laptop computer, he was able to plug into the overhead projection system. During his presentation he cited statistics used in preparing the Green and Shirley (1999) coral trade report, some six years earlier. He failed, however, to acknowledge that those statistics had been shown to be suspect, in the manner I discussed in Chapter Twelve. I drew this to his attention whereupon he then acknowledged that he knew there were problems with the data (briefly summarising those problems for the audience)—but he did not provide updated data. Why was Andy Bruckner presenting old WCMC data as if it were the latest accurate statistics when he knew it was not? Why was accuracy of no apparent concern to him? Presumably he, too, was interested in creating a political assembly around the notion that coral reefs, Fiji's included, were facing a crisis that scientific data did not adequately describe.

There is a contradiction here. On the one hand, international coral reef policy exhibits a faith in science and instrumental rationality. On the other hand, in the way that the Fiji Islands has been enrolled into the global problematic, there is a disregard for the accuracy of statistics and a logic unsupported by statistics. Coral reef experts draw on the authority of science to legitimate arguments that lack a firm basis in the protocols of quality marine science or in reasoned and verified logic. This is a phenomenon that Latour (1993 p. 37-38, quoted in Chapter Four above) called the "invincibility of the moderns", shoring up reason with power and power with reason (a process which Latour sees as unconscious). By this means, coral reef experts enrol others from around the world in their political assembly around the imagined coral reef crisis. This contradiction is significant because it forms the basis for hegemony over developing countries. It underlies hegemonic arguments seeking to justify expert intervention in those countries, summarised in the next section. This raises the question of whether, in these practices, there is an intentional hegemony over developing countries, something which the next half of the chapter addresses.

Coral Reef Politics: Interests, Power and Hegemony (Aim 2)

INTERESTS

It is far too easy to explain hegemony as the result of a coalition of interested parties who act in a mechanical way to attain status and funding, thus furthering their own interests. To overlook these interests altogether would, however, be missing part of the overall picture because it is a useful adjunct to an analysis of power and helps reveal the nature of hegemony. In an interests-based interpretation, ICRI is an alliance of organisations interested in international coral reef policy and management, an alliance that serves to legitimate certain policy approaches to coral reefs while avoiding the protracted process of formal intergovernmental negotiations. The Initiative serves the bureaucratic interests of IGOs seeking to preserve their ability to operate in a world of competitive funding for efforts to transfer western-style environmental policy to developing countries. It also provides a conduit of influence for various groups within the US government and the USCRFT wishing to shape international policy. Moreover, ICRI provides a stage for organisations outside the formal intergovernmental system, enabling them to gain or cement an international profile as significant players in conservation and sustainable environmental management, thus assuring their funding base and aiding their self-preservation (all discussed in Chapter Seven).

Viewed in another way, ICRI is an alliance of professional interests. It reflects contemporary efforts to establish a profession of international environmentalism around coral reefs, an expert system of technical accomplishment with concomitant authority, prestige and social standing, an ecological technocracy. The professionalisation of international coral reef policy has an economic dimension, manifested through competition for funding. Researchers compete for research funding; NGOs compete for funding from philanthropic agencies and corporate sponsors (as well as from individuals, who provide a large chunk of WWF's worldwide funds).

There is conflict between those trying to embed this emerging profession within the international bureaucracies of the UN system, and those trying to bring the prestige of professionalism to

organisations operating outside that system, including but not confined to, international conservation NGOs working on coastal and marine matters. In Chapter Eleven, the role of conservation NGOs as saviours of the planet was re-interpreted to show them as groups of individuals who draw upon the practices of science and instrumental rationality to cement their authority in the contested global space of professional environmentalism. Through offices established around the globe, dialogue with local policymakers, and through local conservation projects, they aim to change local policy. NGOs, including conservation organisations, invent expert policy technologies, creating forms of expert professional authority that serve their own interests. The design of these technologies, and their implementation in developing countries, creates professional opportunities for experts, ways of furthering their professional standing, and provides vehicles for attracting funding. These endeavours establish new relations of accountability and structures of deference, representing relations of hegemony over developing countries—the hegemony of professionalised expertise.

There is an economic element to the bureaucratic interest that large international organisations, whether within or outside the UN system, have in preserving their ability to operate in a world of competitive funding for efforts to transfer western-style environmental policy to developing countries, Moreover, Chapter Twelve showed how efforts to design and institutionalise ways of putting this sphere of trade onto an environmentally sustainable basis are intended to allow the trade to continue to benefit those countries which purchase and 'consume' the organisms, not just those harvesting the organisms. These efforts reflect the economic interests of an industrialised bloc centred on the US, and including Europe and Japan. Economics are central to the bloc's efforts to keep overall control on international environmental policy, to allow that trade to continue to benefit capitalist countries 'consuming' those organisms.

In the design of market-based schemes intended to cover species omitted from CITES, there is, however, no evidence of collusion. Rather, the situation in the Fiji Islands, with different schemes being introduced at the same time, appears to be the coalescence of different interests around the same time. Even so, the overall effect is to maintain the bloc's control of the environmental terms of trade in coral reef organisms. This smacks of a fear that if control were to shift to developing countries, a whole new policy regime might emerge, probably disadvantaging their capitalist interests. This is the fear of a new international economic order, long proposed by developing countries (developing countries' efforts to establish this are described in Rist 1997). It is also hegemony, residing in the bloc's attempts to control of the environmental terms of trade in coral reef organisms—a dominating form of power that removes choice from developing states and serves the bloc's interests at the expense of the latter's. If the exporting countries were to dictate environmental conditionalities, what is acceptable and what is not, and set stricter standards and restrict supply, then the price might rise, to the detriment of consumers. This might happen. There are already tensions within the Fiji Islands about whether the coral and marine ornamentals industry should continue and whether it is a suitable way for *qoliqoli* rights holders to use their resources. People from the tourism industry and the state Tourism Department oppose the industry; the sight of villagers 'attacking' the reef with crow bars conflicts with the image of healthy, natural Fiji which they are marketing. The Institute of Applied Science (IAS, part

of USP and an instigator of FLMMA, mentioned in Chapter Eleven) also opposes the industry for environmental reasons, questioning its long-term sustainability (Bill Aalbersberg, IAS, *pers. comm.).*

Amongst those I interviewed, opinions remain divided as to whether the marine ornamentals industry should continue. Such uncertainty is not surprising given the lack of long-term monitoring data for various species exported. In the meantime however, Walt Smith International are developing a product based on pumice, as an alternative to live rock harvested from reefs (Radio Australia 2005). Gathering pumice off Fiji's beaches after underwater eruptions in Tonga, they suspend it in seawater until coral and algae grow on it, then harvest it for sale as a cultured, artificial bio-rock alternative for aquaria (ibid).

MODES OF POWER EXERCISED IN AN OUTWARDLY COOPERATIVE FRAMEWORK

This is one of several forms of power revealed in the analysis in previous chapters. The allure and moral authority of pursuing the common good is used (as in Chapter Eight)—Arendt's notion of associational power directed at producing a common will to protect nature (a concept of power discussed in Allen 1999). My observations and interviews suggest, however, that rather than being part of a collective associational power, for the common good of humankind on a threatened planet, Pacific Islanders involved in environmental policy matters are generally more interested in the common good of Pacific Islanders, or, on the smaller scale of countries, the common good of their fellow citizens. Thus Arendt's notion provides an unsymmetrical explanation, seeing international experts interested in protecting nature around the globe, and Pacific Islanders interested in protecting Pacific nature.

Chapters Eight, Ten, Eleven and Twelve described a complex suite of modes of power—persuasion, manipulation, seduction, inducement, and, in the case of CITES, coercion being used in conjunction with negotiation and authority. Additionally, the allure of professional recognition has helped enrol local professionals, as has the seduction of being part of a global network with its possibilities—future funding, making professional contacts, plus the sociality of being part of the reef science community.

Power is also being exercised through the use of 'sloppy statistics' to support a precautionary approach. Earlier in the chapter, I cited examples of how statistics that lack any robust data are being employed to enrol the Fiji Islands into the global coral reef crisis, and to justify taking a precautionary approach to trade. If indeed this is how the precautionary principle is being interpreted, this gives an international regulator such as CITES far more power than any of the players in the developing countries that are still putting together a set of modern laws following relatively recent independence from colonial masters. This is another example of power being exercised in a dominating manner.

Latour (1987, p. 2-17, 253) argued that scientists create facts by closing off controversies, and by black-boxing uncertainties and assumptions away from further scrutiny while simultaneously universalising locally specific knowledge by enlisting the support of institutionalised knowledge networks. In both the GCRMN process and in UNEP-WCMC/ CITES concern about the global coral trade, uncertainties about the extent of degradation worldwide are being closed off from further scrutiny. Moreover, Chapter Six showed how, in the construction of the crisis narrative and its repetition as citations in scientific papers, uncertainties about long-term trends, about causative agents,

even about whether we should be concerned, are being avoided. When statistics are used to support certain policy approaches, without acknowledging how these are uncertainties have been closed off, this constitutes domination, more so because of the proximity, in this case, of those closing off the controversies and those promoting the policies—sometimes the same people (Wilkinson, Hoegh-Guldberg and M^{c}Clanahan for example).

Although international environmental policy is commonly regarded as an exercise in cooperation, this analysis shows various modes of power employed to get Fiji Islanders to cooperate in coral reef policy. Rather than cooperative, international coral reef policy should be regarded as power-filled. As this analysis has showed, all players do not cooperate on the same terms in some idealised notion of either associational or equal power. Cooperation is not necessarily equally good for all parties; it can even be the basis for a hegemonic relation, as the next section affirms.

HEGEMONY AS A RELATIONSHIP OF DOMINATION

The developed/ developing country dichotomy is generally regarded as a clue to potential hegemony. But if we labelled everything that derives from outside the Islands as being hegemonic, that would devalue the term. It is important, therefore, to distinguish different manifestations of hegemony and analyse how they build a hegemonic politics—through universals, naturalised discourse, technical practices etcetera. The section summarises the various manifestations of a relationship of domination revealed in previous chapters.

In this consideration of whether the transfer to developing countries of Western environmental policy ideas may be a form of hegemonic control, I start not from the idea that hegemony has utility in maintaining order in the international system or that it delivers aid and funding to help fulfil the promise of modernisation. Rather, I start from the premise that hegemony is a form of western domination that may appear as a mode of power that subordinates, which needs to be exposed and overcome (Chapter Four).

Western superiority

The analyses of coral reef policy endeavours in Chapters Six to Thirteen suggest that a relationship of domination has been set up around the concept of Western superiority. This relationship occurs widely: in matters of governance and policy, in a wide range of professional and technical skills associated with marine science, conservation and policy (e.g. survey, monitoring, report writing, research, species identification, in the intellectual capacity of the reef science community; in the institutions 'needed' to manage coral reefs; and in values, the latter presaged in Chapter Three and demonstrated in subsequent chapters. Stories about coral reef degradation based on the Malthusian concept of overfishing, and related neo-Malthusian ideas about the cause of that degradation, portray Third World populations in this manner (Chapter Eight). So too, in a more subtle way, do scientific texts that portray experts as being able to identify degradation, and recommend steps to take to address it, while peasants/islanders keep on fishing either in a state of ignorance about the effects this is having, or because they lack capacity and political will to address any concerns they may have (Chapter Eight). Fijians harvesting

reef organisms are seen not as experts in their own culture but as the cause of changes in coral reefs (e.g. Dulvy *et al.* 2004).

The inherent relationship of domination over Third World societies found in expert texts on coral reefs is the same expression of Western superiority found in modernisation theory. Collectively, the metaphors, narratives and arguments recurring in these texts present a hegemonic view of the world in which developing countries are recreated as sites for intervention by professional experts. Employing concepts such as capacity-building and the marrying of conservation and development, they depict western experts as possessing superior intellect and technical skills, and portray people from developing countries as lacking skills to address those problems, and in need of expert western assistance.

As Said (1978) pointed out in his treatise on Orientalism, such depictions are problematic not just because they inform colonial and neo-colonial practices but because they begin to be taken on as a self-image by those depicted. In the Fiji Islands, the perceived primacy of western experts in the field of environmental policy is encouraging the internalisation of such self-imagery, although some, such as Reuben Sulu, introduced in Chapter One, and the indigenous FLMMA experts, actively fight it.

Although these texts do not actually constitute domination, they facilitate it. They set the scene, through their pervasive and persistent positioning. Thus, Fiji Islanders are being subordinated by the roles to which they have been assigned—the agents causing coral reef degradation; the villains of the crisis narrative; the ignorant and the undeveloped. In creating these villains, coral reef experts position themselves as saviours. Just as modernisation is seen as a trajectory along which all societies must progress, degradation is a trajectory down which coral reefs in developing countries will slide unless those countries (state, local NGOs and local communities) apply the coral reef community's standard prescriptions to arrest this and unless they accept that community's help to climb upwards again.

This notion of western superiority seems to be accompanied by the assumption of a special right to manage. As Fry (1997) observes in his analysis of how, in the heartland of Australian rational thinking inhabited by politicians, foreign affairs journalists, and academic economists, South Pacific islands are being framed, such assumptions are most difficult to acknowledge, being steeped in old racist premises. This analysis of international coral reef policy has revealed the same self-imposed western right to manage the environment of developing countries that Fairhead and Mearns (1995) found embedded in policies addressing the supposed environmental crisis in western Africa, mentioned in Chapter Three. They, too, showed this perceived right to be born of stereotypes from the colonial era.

In the Pacific region, this notion of western superiority and the right to manage ecosystems such as coral reefs is particularly significant when one realises the extent to which reefs occur in territories of colonial powers, the US and France in particular (Table 3). In Chapter Seven, I described how the US incorporated not just its dependent territories but also those Pacific states freely associated with it into its Coral Reef Task Force's initiatives.

The politics of concern: a bias towards seeing developing countries as the cause

This bias towards seeing developing rather than developed countries as the cause of the imagined coral reef crisis is one of the forms which hegemony takes in coral reef policy. For example, arguments about the environmental impacts of trade in reef organisms concentrate on impacts caused by collectors not by end-point consumers. International efforts are directed at the countries of export and at technical controls on harvesting, handling, transport and so forth. They are not directed at restricting demand. Neither ICRI, GCRMN nor the ICRS have decried the consumer demand which perpetuates the bizarre trade in organisms for aquaria, or the lifestyles that led to it. There is little outrage directed against the consumer lifestyles which have led to the craze for home aquaria, tanks of colourful tropical reef fish and corals, brightening living rooms across America, Europe and Japan. In contrast, there has been some concern directed at the trade in live reef fish for food—a trade centred on China. Perhaps it is acceptable to criticise Asian consumers but not American and European ones.

An example of blindness to local policy approaches

The discourse of international environmental policy, with its biased view of western superiority, is blind to policy approaches being formed elsewhere. This can be seen in criticism of modern state-run management of coastal fisheries in developing countries as inadequate, often poorly implemented (Chapter Eight). Such criticism judges the state in small island developing states against some generalised model of the state in developed countries. It judges their systems of fisheries governance against some idealised notion of fisheries management; finding that these differ, it assesses those of the small states as inadequate. But the coral reef fisheries of the Fijian Islands are not the type of fishery that modern fisheries resource management aims to control. They are not industrial fisheries, they are low-tech ones. They are not single-species fisheries; they encompass dozens of species. These have never been open access fisheries—the supposed race to fish phenomenon has never been a threat. They have never been under sole management of a central state—the indigenous system has persisted and still is a significant component of the governance of the fisheries.

The role of the state differs in these two situations (the Fiji Islands and an idealised notion implicit in modern fisheries management ideology). As well the operations of the Fisheries Division, there is another functioning system of fisheries management in the Fiji Islands involving the leaders of Fijian communities and the Fijian district administrations (provincial councils). This composite system of governance includes constraints (such as taboos) and disincentives such as the fear of physical violence (see Chapter Ten). Thus, state fisheries management is only one part of a bigger system. Furthermore, when domestic non-governmental agencies or international agencies start fisheries management projects in the Fiji Islands, the state cooperates in these; they are not carried out in some non-governmental sphere that excludes that state, as Chapter Two illustrated.

In the Fiji Islands, the contemporary system of fisheries management evolved as the country modernised, but this does not necessarily mean that the indigenous Fijian elements of the governance system are 'weakened' or that the state has failed in its management. What has evolved is a functioning, complex system of governance that acknowledges indigenous rights and accommodates a

range of commercial uses, and even modern recreational use although in a way that those used to open access of countries like New Zealand find cumbersome. There are means of resolving conflicts in resource use. The *qoliqoli* managers have ways of dealing with this, even though one traditional approach (physical violence) is anathema to many people in developed, democratic countries, and illegal under national legislation. The state also helps mediate resource conflicts.

This suggests that rather than being a failure, or lacking capacity, the state is one part of a governance system for coastal fisheries that is functional and developing to accommodate the specific political circumstances in Fiji Islands and indigenous political aspirations. This alternative interpretation illustrates the bias of an interpretation following the storyline of orthodox discourse: a bias towards western systems of governance as appropriate systems, with an inbuilt bias towards believing that any alternatives will necessarily be failures. That bias prevents local efforts to address problems being acknowledged; instead, it sees those local efforts as part of the problem being imagined.

What is being subordinated or lost?

The accounts of hegemony summarised in Chapter Three suggested that the ventures by which international environmental policy is created and disseminated to the Third World are a form of cultural modernisation, one that eclipses the local, its knowledge, culture, traditions. Those accounts were, however, largely silent about what aspects were being displaced or eclipsed. The methods I have used to examine various international coral reef policy endeavours connecting with the Fiji Islands have not produced any such illumination either (this was not the study's aim).

This lack of illumination may reflect what Latour has called the hybridisation of modern life. When culture and nature, facts and values, rationality and irrationality, states of the world and representation have been hybridised, it becomes difficult to separate them in order to distinguish a 'pure' state. In the modern world, whether in the Fiji Islands or New Zealand, France or the US, the character of the local is as elusive as the notion of wild nature (see Bess c.2003 for an explanation of the latter difficulty), because the local is already a hybrid created by modernity.

Nevertheless, in the ongoing process of hybridisation there is a sense of loss. Hornborg (1994 p. 260) describes the co-optation of local voices, and the corresponding shift of motives, that occur when 'locals' enter one of modernity's specialised sectors for identity construction (such as the professional fields of environmental policy or conservation).

> If the individual has to choose whether to define himself in terms of local or abstract referee-points, the movement from local to global will tend to be irreversible, and there will be a continuous co-optation of local voices into placeless, guild-like frameworks. Without the constant, experience-near resonance of place, these voices risk forgetting the contexts in which they were raised, devoting themselves to the perfection of their own, objectified intonation, echoing in the empty labyrinths of disembedded abstraction (Hornborg 1994 p. 260).

The local is already part of the global, a relational effect of social interaction where identities are complex and historically changing (Doreen Massey's concepts described in Chapter Four). Chapter Eleven illustrated how, when international conservation NGOs employ their expert policy technologies

in the Fiji Islands, and a decontextualised discourse is adopted, there is a further distancing from the local as an isolated archipelago in the broad Pacific Ocean with its unique people, culture and nature. The archipelago becomes part of the political assembly around the global environmental crisis, and Fiji Islanders working to institutionalise international policy approaches and technologies become part of a global profession actively working to enrol others in that assembly.

Also being lost is the space and time needed to develop for local policy designs and technologies. Overseas agencies are saturating the country's resource managers with different policy approaches, leaving little space for any local redesign. Time and energy is committed to participating in these Western-designed schemes, not in analysing the situation and designing their own style of response. Thus, indigenous initiatives such as FLMMA use overseas policy technologies rather than developing their own. This is of concern, as are the inefficiencies and confusion likely to result from multiple policy approaches.

This can be seen clearly in the three simultaneous attempts to institute different schemes for managing the environmental effects of Fiji's trade in coral reef organisms, described in the previous chapter. Each scheme focuses on particular group of reef organisms, and each justifies the trade in that group continuing under its own particular style of management. In trying to cooperate with every foreign organisation promoting its particular policy scheme, the Fiji Islands state will end up with the harvest of organisms from their reefs managed under three very different approaches. Because, in the Fiji Islands, the MAC scheme and the initiative to produce global standards for the live reef food fish trade are not fully institutionalised, the full consequences may not yet be visible. Thus, there is hegemony not just in the individual schemes are discussed in the previous chapter, but in their aggregate. Despite the diversity of players, the multiple conduits for policy ideas, the different policy approaches being followed in these three schemes are, in a collective sense, hegemonic—domination achieved by removing choice (see p. 87).

Furthermore, in conferring on agencies from developed countries the right to intervene in developing countries, without the converse, environmental policy discourse is disadvantaging people from developing countries. Insistence that policy solutions have to be those of the west, and western agencies have to be funded to institutionalise them, is another form of economic disadvantage, since those practices have become a business that benefits western experts more than those from developing countries, as Third World analysts of development practice have made known.

THE ROOTS OF HEGEMONY

In Chapter Four, I identified how, for domination to be considered hegemonic, two elements are presumed: the capacity of a dominant group to exercise control, and the willing acquiescence of those subordinated. Without the latter, hegemonic policy does not exist; if beliefs are fall upon stony ground or are adapted for local purposes, then hegemony is prevented or limited. Thus the hegemony of coral reef policy is limited by the way locals co-opt discourse to suit their own purposes. Nevertheless, when it comes to coral reef policy there is sufficient, diverse evidence to suggest those acts of co-optation described in Chapters Ten and Eleven do not somehow neutralise the hegemony accompanying the

institutionalisation of western environmental policy discourse and policy practices. Asymmetry still exists. Hegemony occurs *despite* the Fiji government's downplaying of national environmental policy in the face of pressing political concerns and the exigencies of electoral competition (Chapter Seven) and despite the local actors' active co-optation of discourse and discursive devices (Chapters Nine to Twelve). Acts of co-optation do not negate the way in which western agencies have so saturated the Fiji Islands with policy ideas and schemes, that local actors have little time or energy to develop their own approaches. Nor do they completely cancel out the pervasive message of western superiority. They have not reworked the economic terms of trade in favour of the country of export as opposed to import.

In regurgitating standard storylines that are intimately rooted in discourses of presumed superiority, mission, and negative essentialisations of the Other, western experts appear to have no strategic desire to dominate developing countries. Rather, as I discussed in Chapter Eight, in their technical practices and talk, experts create the situation for expert intervention for entwined reasons, their motivations ranging from the selfish pursuit of wealth and power to the selfless mission of building a common will to protect nature. They act to maintain their legitimacy as experts, to pursue professional opportunities, and to maintain certainty and order in their world. Chapter Ten showed similar motives and interests amongst the groups in the Fiji Islands with whom international connections being forged.

Aspirations of control

This desire for certainty and the maintenance of order deserves further attention. Amongst those involved with ICRI, ICRAN, GCRMN and various NGOs promoting coastal conservation, it materialises as an aspiration to control nature in a world becoming increasingly complex as scientific knowledge 'advances'. This aspiration can be seen in the concept of adaptive management discussed in Chapter Eight and Eleven. It also appears in the desire to, and confidence that humans can, avoid the level of coral reef degradation that could potentially either remove a sense of what, natural, healthy, beautiful ecosystems are or could prompt catastrophic extinction.

As discussed in Chapter Two, this sense of confidence in experts' ability to control Nature is typical of the modern age: humankind's capacity for planning and control, predicated on confidence in their ability to subjugate nature as an unruly force. Coral reef experts maintain a sense of hope that the crisis facing coral reefs can be averted, even as they continually recreate that crisis by adding and disseminating stories about reef degradation. They maintain this hope even in the face of growing awareness of the complexity of nature, and in the face of a growing body of theory about nonequilibrium, even chaos, in natural systems (Chapter Eight). Moreover, they do so by relying on simplistic notions of human society, both those using and governing coral reefs locally, and the social groups of experts propounding their solutions to the coral reef crisis. If society is 'simple', then experts can identify the changes needed to save coral reefs—an illusory argument.

Although there has been a trend over the last few decades for coral reef scientists to recognise the increasing complexity of the biophysical world of coral reefs, these insights from complexity theory and the 'new ecology' have been confined to the non-human components of coral reef ecosystems. There has been no corresponding trend to recognise the complex nature of the social world of those

people who use and govern reefs in developing countries. The concept of adaptive management espoused by FoS and others (Chapter Twelve)—a process of incremental management responses with close monitoring and built-in iterative learning to allow managers to respond to thresholds and surprises of reef management (Nyström *et al.* 2000)—is designed to address the complexity of natural rather than human systems.

We have, instead, simplistic, positivist arguments about the cause of coral reef degradation (analysed in Chapter Eight) and simplistic notions proffered to explain why developing countries have not enthusiastically adopted ICRI's prescriptions: a lack of political will and capacity. But more than that, there is no attempt to understand the complexity of those societies. ICRI does not call for any such studies. Furthermore, the campaign to marry conservation and development, which WWF and other NGOs are pursuing (Chapter Two), will not result in any such understanding as long as it proceeds from its positivist assumption that the aim of science is to identify causal relationships in an objective world.

Amongst those of the coral reef science community involved in ICRI and those promoting policy prescriptions to save coral reefs, this emphasis on understanding the complexity of the non-human world of coral reefs, but not that of human world, constitutes a form of domination. Their simplistic view of the social echoes what Blaney and Inayatullah (2002 p. 127) call the "global hegemonic politics of comparison" found in International Relations theory and incorporated into neo-modernisation, whereby difference is "almost pre-consciously treated as simultaneous with disorder, fear, suspicion and condescension". To paraphrase, in the semantics of environmentalism, Blaney and Inayatullah's comments on the campaign to bring liberal democracy to the developing world: the cultural conceptions of Western environmentalists are constructed as normal or natural in relation to marginalised peoples and regions perpetually on the road to mature environmentalism (ibid). There is a direct parallel with the blindness of modernisation theory's metaphor of the process of modernisation: as long as there is a strategy for achieving the modernisation (cf. environmentalism) of countries not yet in that state, there is little need to understand the intricacies of their society. Instead, simplistic lists of failures and shortfalls will suffice, for those are what need to be remedied, to propel those countries up the slope to modernisation/environmentalism.

Western experts bringing environmentalism to countries such as the Fiji Islands seem to equate the latter's approach to nature with disorder, and their own mission as one of bringing order and control. Modernisation entails universally mandated standards of progress and order, and Western, modernist aspirations for certainty and control are flowing over into the arena of international environmental policy. Yet, for Banuri (ibid), the primary objective of the modernist hierarchy—the assumed superiority of the impersonal over the personal as a way of thinking about the world—is not pedagogy but control; not helping to understand the world but rather helping to maintain existing but oppressive structures of power. He (1990 p. 89) argues that, rather than expanding human freedom, modernisation is legitimising the denial of sovereignty to the populations of the Third World, and to the common men and women of Western countries.

Since it is far more likely that industrialised countries will destroy the biosphere than Third World ones, as reflected in the relative ecological footprints, then what is the source of these experts' apprehension about Third World environmental practices? It may be a fear of the disruption of the international systems; or of diminishing power over the environmental terms of trade; or perhaps a general preference for the known over the unknown.

Is this modernity as Latour (1993 p. 41) described it—moderns not thinking at all about the consequences of their innovations (the creation of society/nature hybrids) for the social order, to such an extent they are unconscious of its hegemony? Or is it a more insidious form of political manoeuvring and hegemony? A consideration of ICRI's politics suggests the latter.

ICRI's conservative politics

ICRI's politics incorporate a general anxiety, not about what industrialised civilisation is doing to the planet, but about the effects of the process of modernisation in those countries that are still industrialising or yet to industrialise. Although these politics exhibit faith in industrialised nation-states and the UN system, they contain doubts about whether developing states are being modified fast enough by environmental consciousness. ICRI's strategy is a variant of ecological modernisation: all paths out of the environmental crisis are believed to lead further into modernity (cf. Mol 2003). In seeking answers to the problems of reef degradation within current systems, this strategy is politically conservative. In arguing the need to address coral reef degradation at multiple levels of governance from communities up to the UN, the strategy is to preserve the present political order in the international system.

The efforts of ICRI and various NGOs whose work I have described are, in effect, an attempt to maintain the established order between industrialised countries (US, Europe including Scandinavia, Japan and Australia are all implicated) and the Third World countries where the vast majority of reefs occur. Their politics aim to maintain both an existing social order embedded in modernity that is focused around expert systems, a professional-laity relationship, and the existing political order between industrialised and non-industrialised countries as blocs. Underlying this is the belief that modernisation provides the means to control its own environmental effects through specialised expertise, also the hope that experts hold of addressing those effects. This is the optimism of modernisation, the confidence that international efforts will, through scientific reason, instrumental rationality, international cooperation and progress, address the challenges posed by widespread environmental degradation.

Commonsense and technical practices at the root of hegemony

These experts' efforts to institutionalise a shared sense of the necessary response to the coral reef crisis draw upon standard prescriptions such as environmental assessment and monitoring; planning; creation of protected areas; market-based prescriptions; improved community resource management; and improved state practices. These are 'practical' solutions: accepted as environmental commonsense rather than as novel, experimental approaches. A hegemonic politics is being built partly through such commonsense science/policy technical practices. Those practices include the rhetorical style used in

scientific papers, the practices used in creating global environmental status reports, ecoregion planning, and capacity-building projects. These imagine environmental problems on an international scale and in such a form that their pre-chosen policy prescriptions appear as 'solutions' to those problems, thus providing the basis for expert intervention. In effect, such practices legitimate scientific practice, knowledge and activity on an international scale, and authorise the use of science, conservation, environmental aid and capacity building in maintaining public order and social trust within an international political system.

Conclusion

In international coral reef policy, the basis for western hegemony over developing countries arises from that way in which the crisis has been constructed and a shared sense of the necessary response to it institutionalised. Embedded in these western approaches to coral reef policy is a relationship of domination: Technical practices, along with the discourse shaping global environmental policy and the universals that through which policy travels the global, create and sustain this relationship. These policy-travels are both enabled and constrained by the discourse of global environmental policy. Policy works through universals, knowledge that moves across localities and cultures, forming channels of communication (Chapter Four). While international policy is, on the one hand, a realm of ideas, on the other it is a practical, engaged universality (a concept discussed by Tsing 2005 p. 1).

The hegemony of international coral reef policy is predicated upon the universal of working together across national boundaries (whether this be called collaboration, cooperation or whatever) as much as in those of neoliberalism and science. Immersed in orthodox discourse, we generally find it difficult to recognise cooperation as a potentially hegemonic universal in matters of environmental policy. It is much easier to recognise as hegemonic, those universals that politics creates; since politics is the exercise of power, these are routinely labelled as hegemonic to one or other groups or cultures. Similarly the universals of capitalism (such as market-based schemes) are routinely regarded as hegemonic on economic as well as political grounds, when applied to small and/or relatively unindustrialised countries enrolled into a global economy dominated by large national economies and transnational firms. The charge of hegemony is less commonly levelled at science's universals, even though the act of creating universals is central to the practice of science. This is because science still largely rests on the notion that it is objective and apolitical. Yet the roots of hegemony in international coral reef policy lie partly in technical practices of science and its hybridisation with environmental policy on an international scale.

As an instrument of international governance, coral reef policy arises at multiple locations in developed countries. In these developing countries, various agencies loosely linked into ICRI forge multiple contacts in their efforts to extend their political assembly—into state agencies, communities, local NGOs and academic institutions. In Fiji, transitory visitors and socio-technologies such as emails, faxes and letters play a key role in maintaining the network forged at international meetings and workshops; so too do policy technologies. But none of this would happen in the absence of this professionalisation of the business of conservation and environmental policy. This emerging

professionalisation of international environmental policy and conservation is feeding the hegemonic production of expert policy technologies and policy commonsense. The appearance, in developing countries, of a suite of recently-established US-based NGOs is a sign of this professionalisation, as is the re-orientation of international research agencies such as the WorldFish Centre to policy and the conversion, in progress, of SPC's marine resources division from a technical to a policy section. The opportunities created by this professionalisation attract local policy actors to these manifold international schemes to protect the environment of the Fiji Islands, lengthening the network further.

The next chapter reflects on what these phenomena—western hegemony over developing countries in matters of environmental policy, the emerging professionalisation in this field—tells us about world history in the making. In doing so, it concludes this thesis.

Chapter Fourteen

Conclusion

Insights from a Trans-disciplinary Study

Concentrating on how policies arise as instruments of governance, organising people within systems of power and authority, this thesis continues the work begun in Shore and Wright (1997) and Peet (2001). It advances anthropological and geographical enquiry into the place that policy occupies in the contemporary world, at the same time extending Latour's (2004) insights about the relationship between nature, science and society into the field of international environmental policy. Putting back together what modern thought commonly separates—politics and environmental policy—through an eclectic set of social science theory and analytical perspectives, the study reveals the interests, modes of power and the knowledge/power system shaping international coral reef policy. In doing so, it provides an alternative to ecologism's orthodox interpretation of the politics of nature described in Chapters One and Two.

In undertaking this research, I intended to create new consciousness about international environmental governance and policy (as Chapter One explained). I wanted to challenge the idea that widespread environmental degradation in the Pacific Islands is a future inevitability, and to open up space for seeing environmental crises as political assemblies *sensu* Latour. When political and ideological projects masquerade as truisms and it becomes difficult to recognise the ways in which power is being exercised, then the space for political engagement is severely restricted (Allen 2004). By exposing the exercise of power and demystifying how, in drawing Pacific Islanders into their orthodoxy, common contemporary policy stances on environmental issues are able to have such power, I have begun to open up space for political interventions, so that in future, alternatives may be envisaged not just in developing countries but also in international policy agencies.

I have opened up this space by exposing how contemporary efforts to transfer environmental policy to developing countries draw on the theory and ideology of modernisation, yet disguise their politics in technical discourse. Using Latour's insight into the invincibility of the moderns accorded by our Constitution (discussed in Chapter Four), I have shown the contradictions embedded in western efforts to transfer environmental policy, revealing these to be a political assembly around the notion of an ecological crisis and not the politically neutral enterprise implied by the orthodox view of science being value-free. And I have critically analysed international coral reef policy, something which has been sorely lacking, as the text box in the previous chapter, titled *Critiquing international coral reef policy*, illustrates.

In describing how coral reef policy endeavours are largely outside any formal environmental regime yet making multiple connections with developing countries, the thesis makes an original contribution to

both the geographical study of globalisation and the study of international politics. It shows the network character of international policy endeavours. Professional experts are the 'actor face' of networks that operate within and around formal state organisation at national and international level, yet, without distinction, forge their own connections with what is often taken to be 'civil society'.

These experts are central to the globalisation of ideas found in coral reef policy processes. Overseas specialists forge multiple points of contact with the developing world in order to institutionalise a conservative, pre-selected range of standard policy prescriptions. Most of this traffic in policy ideas is one-way, directed at developing countries, although some ideas are being exported from countries such as the Fiji Islands. There is no overall strategic direction to these efforts to save coral reefs, rather a coherence provided by a crisis narrative and an informal document, a *Call to Action*, both carefully constructed by a group of experts. The same group has formed a network under the brand of ICRI, under which they continue to promote their mission to intergovernmental agencies and international policy meetings and to run the operations that enrol more and more people and reefs around the world.

Transferred from multiple locations in developed counties, coral reef policy becomes an instrument of governance in the Fiji Islands through the framework of a common will to protect Nature. That outwardly cooperative framework disguises how international players encouraging Fiji Islanders to participate in their endeavours and to adopt their policies are, in fact, exercising modes of power ranging from coercion associated with negative sanctions to dilute forms of seduction. Moreover, the moral and economic framework provided by a common aspiration to protect nature disguises how Pacific Islanders working in local agencies (governmental and non-governmental) co-opt the narratives, storylines and metaphors characterising coral reef policy texts for the same purposes as those who create these situations for expert intervention in developing countries. Experts in environmental policy and conservation, wherever they are based, seek to maintain their legitimacy, to pursue professional opportunities, and to maintain certainty and order in their world. But while their endeavours to maintain a sense of hope for, and control over, a seemingly complex, chaotic natural world drive ecological science to more sophisticated levels, there is no matching effort to incorporate into international coral reef policy a sophisticated understanding of a culturally, socially and politically complex, interconnected human world.

I have revealed how a modernist discourse shapes much contemporary thinking about environmental governance, by examining how exactly professional experts, both foreign and local, are involved in transferring western ideas about appropriate environmental policy to the Fiji Islands, and by analysing how those ideas accord with modernist thinking. I have also shown how international environmental policy endeavours draw on the aspirations of Fijian communities for development. In doing so, they enrol Fiji Islanders as partners in a hegemonic relationship predicated on western superiority.

In revealing the contribution that experts (policy/science/conservation professionals) are making to hegemony in international environmental policy, this thesis makes an original contribution to critical studies of international policy in an ethnographically engaged and geographically responsible way, thus responding to two separate calls in geography, made in Peet (2001) and Sparke (2004). It extends these studies beyond a discussion of neoliberalism to focus not just on experts but on the shaping influence

of a dominant discourse of global environmental policy and the central roles played by concepts of modernisation. Embedded in this discourse is a relationship of domination that portrays people in developing countries as the cause of local environmental degradation while ignoring extra-local dynamics and the broader context within which local actions occur. Biased towards western systems of governance, the discourse fails to comprehend the complexity of local governance systems.

Hegemony in matters of international environmental policy is not well recognised, in contrast to hegemony in matters of development (sustainable development included). In the Pacific region, analysis of environmental policy tends to be subsumed into critiques of sustainable development; the development component is then the subject of critique while the environmental component is often viewed from the orthodox perspective of global environmental policy discourse. The book *Strategies for Sustainable Development: Experiences from the Pacific* (Overton and Scheyvens (eds) 1999) illustrates this; it investigates the hegemony of development while generally accepting foreign policy prescriptions for conservation as universally beneficial, although cautious over eco-tourism.

In the conclusion to *Strategies for Sustainable Development*, Overton *et al.* (1999 p. 264) suggest that the past can complement the present, allowing people the option of combining and adapting what they consider to be the best of the old and new (citing several case studies where this is happening), thus producing a "more basic and diverse notion of improvement and well-being" (ibid). The same could be said about notions of appropriate relationships with nature and of environmental quality. The type of critical analysis applied to development could usefully be extended to environmental policy matters. Any such analysis must, however, acknowledge how the concepts of development and progress embedded in contemporary environmental policy have a particular ideological basis, provide a platform of relationships of power, and represent particular political interests. The study has clearly shown this to be the case for coral reefs policy.

This thesis has also cast light upon the relationship between modernisation theory and international environmental policy. Modernisation theory, upon which the contemporary notions of development found in international environmental policy are based, contains an inherent weakness: the way the that modernist thinking, when combined with modernisation theory's approach to developing countries, produces hegemonic international environmental policy belies the assumption of universal benevolence embedded in it. Incorporating a hypothetical, teleological rationality that configures particular contexts as cases within a unilinear, evaluative scale of modern-ness and development, modernisation theory is blind to its own simplistic argument, viz. as long as there is a strategy for the modernisation of countries not yet in that position, there is little need to understand their societies' intricacies, as discussed in the previous chapter. The act of revealing international environmental policy as being based on this ideology rather than on politically neutral, technical considerations, combined with the revelation that it produces hegemonic policy, casts doubt on the ability of international efforts to address, through scientific reason, instrumental rationality and international cooperation the challenges posed by widespread environmental degradation. Furthermore, modernisation theory's simplistic caricatures of the complex social world of those using and governing reefs in developing countries cast doubt on the efficacy of framing international environmental policy around modernisation theory.

Developmental Environmentalism: Rewriting World History

The post-Cold War version of modernisation (sometimes called neo-modernisation) focuses on diffusing various attributes from western centres of expertise—not just environmental norms but also notions of democracy, social justice, gender equity and human rights. Contemporary analysts of international environmental policy, concentrating on diffusion through formal environmental regimes, have overlooked how the diffusion of environmental policy, often outside of any formal regime, not only constitutes neo-modernisation but is further integrating the world. These analysts have failed to recognise how such environmental policy networks are deepening the integration of the world in a hegemonic way. Moreover, social movement analysts, in equating global civil society with emancipation and development, have overlooked hegemony in environmental matters. This is where further trans-disciplinary studies will be valuable, interrogating the central place that environmental policy has in shaping world history.

This deepening integration is an important point. In the 1840s, Marx claimed that big industry, competition and the centralisation of capital created world history for the first time, "insofar as it made all civilised nations and every individual member of them dependent for the satisfaction of their wants on the whole world, thus destroying the former natural exclusiveness of separate nations" (Marx and Engels 1970 p. 78). Now, environmental degradation is writing a new history of world integration and interdependence, that of the Anthropocene. Already known as an emergent era of natural history, the Anthropocene (so-called by International Geosphere Biosphere Programme and other earth scientists), marks a new series of geological, biological and climatological forcing mechanisms in the biosphere (Dalby 2004 p. 2).

> We have left the period of the Holocene, the relatively stable period of earth history between the end of the last ice age and the appearance of industrial society. Human activities have introduced new biophysical factors into the biosphere and begun to change the physical parameters that determine the functioning of the major earth system processes. Hence a new geological period (Dalby 2004 p. 3).

The Anthropocene is not just an emergent era of natural history; it represents the deepening integration of humankind, an accepted interdependence as humans adjust to the belief they are altering the biosphere's functioning, particularly the climatic system. Since the extensive coral bleaching events in 1997-98, the Anthropocene has been the frame of reference for ICRI's political assembly around the image of a coral reef crisis: the idea that by influencing the climatic system, humans are exacerbating, maybe even causing, coral bleaching. However, people began assembling around the environmental degradation of coral reefs much earlier, as Chapters Five and Six show. ICRI was initiated in 1994 and GCRMN in 1995 although the latter had been discussed several years earlier. So while climate change provides the reference frame for contemporary coral reef policy, before the bleaching events of 1997-98 that frame comprised nature in need of rescue, along with the postcolonial legacy of discriminatory land policies and coercive conservation with spaceship earth as a metaphor for the need for technocrats to be in charge (Chapter Eight).

Both frames incorporate ideological statements about how the world is meant to be and about who should be in charge of achieving that—science/policy experts who see themselves as ecological technocrats. Both frames acknowledge the fear that those in the ICRI network, along with various MEAs, and conservation NGOs, have—the fear of the environmental effects of modernisation in the Third World, rendered as an inability to step aside and let things take their course. Contemporary industrial societies see not just themselves, but the entire developing world as it modernises, as a 'risk society'. They fear the consequences of that modernisation even as they acknowledge the right of Third World citizens to development. So, Western experts set out to critique and reform not just western society but the rest of the world.

In reforming the Third World, these experts are putting their faith in ecology. Ecology is not only an ideological statement about how the world is meant to be as Forsyth (2003 p. 268) suggests, and an aesthetic "environmentalist trope of pristine nature" suggesting the importance of minimising alterations to habitats, coral reefs included (as discussed in the previous chapter). It has also become a model for the practice of development under the control of ecological technocrats. As a strategy for humankind's future, development is no longer necessarily progressive and unidirectional, it is ecological and adaptive under the guiding hand of experts.

Yet this is not the frame of reference that predominates in the Fiji Islands, neither in the state nor in Fijian communities (Chapter Nine). There, development is viewed as a right, and the practices of development an opportunity for advancement (Chapter Ten); the aesthetic environmentalist trope of pristine nature is foreign, as is the idea of science/policy experts controlling the environment. Fijian communities have charge of their own *qoliqoli*, and the state intends to confirm those communities' proprietary and usage rights over coastal resources in national legislation (Chapter Nine explained the current legal ambiguity surrounding this matter). In the Fiji Islands, traditional and modern social relations co-exist, as do traditional and modern relationships with nature. The emergence of a global ecological society is contemporaneous with a traditional, community-based ecological society and a post-colonial national one. There is no paradox in this (cf. Jung 2001); this is the reality of modernisation in the Pacific Islands. The theoretical dichotomy between tradition and modern is just that, theoretical.

Experts (the specialists of environmental science/policy and conservation) are connecting these two frames of reference in a process of global transformation I call developmental environmentalism. In forging this connection, these international environmental experts are writing a new world history, the act of connection integrating humankind around the globe at the same time as it further differentiates social function (through division into different fields of expertise as Chapter Four discussed). This deepening integration of humankind is comparable to Elias's (1994 p. 332) account of the (historical, European) civilising process entailing the lengthening of chains of organised social action and "the formation of ever-larger units of integration on whose fortunes and movements the individual depends, whether he knows it or not". The discourse of global environmental policy enables and facilitates this integration by portraying the world as increasingly interdependent (Chapter Two), thus setting the scene for expert intervention in the Third World in order to protect the environment.

Developmental environmentalism is re-characterising and deepening global society by drawing the Third World into First World imaginings of the environmental crisis and by enrolling its citizens in environmental policy prescriptions proffered as a cure for the crisis. The world canvas on which this environmental reform is happening is not one devoid of history and international norms. Jung (2001) has pointed out how the formation of post-colonial states has been heavily influenced by a pre-existing international system, that system preventing newly independent states from meeting the dominant conception of states as unitary actors.

> In most parts of the globe, state-building has taken place under the normative and power-related constraints of the international system. The post-colonial state-makers were not able to fight those large scale state-building wars [which produced an international system shaped by anarchy and self-help] as their European predecessors did. Being from its inception dominated by the larger unit of the Western state system, non-European state formation has not been operating by the same rules. In pursuing their interests, the political entrepreneurs of [Oceania,] Africa, Asia, the Middle East or Latin America have had to conform their actions to the already existing norms and power relations of a hegemonic international system (Jung 2001 p. 462).

Post-colonial states are expected to follow a shorter route to development than that of European and North American states. In doing so, they are expected to move progressively towards the environmental standards and norms of developed countries, and to conform to the relationship of domination inherent in those norms. The format of policy processes expected of them are western in origin, as are the imported solutions upon which they are urged to rely. Moreover, they are so crowded by foreign policy prescriptions there is little time or space to redesign their own relationships with nature.

Developmental environmentalism is a political assembly around the notion of an ecological crisis, and as Latour and Weibel (2005) pointed out, each such assembly has its own notions of freedom and domination. But, as I have shown for the political assembly around coral reefs, these are not readily visible or acknowledged. The notion of freedom is that of cooperation and collaboration and all notions of domination are hidden. There lies the rub.

What hides these notions of freedom and domination is the technical face with which environmentalism is presented to the Third World, not merely the centrality of science and rational planning but of professionalised expertise. This occurs because the thought that characterises simple modernisation persists despite the contention of sociologists (e.g. Giddens and Beck) and development analysts (e.g. Shuurman and others (1993)) that we have moved on. In developmental environmentalism, the concepts of diffusionism, instrumental rationality and functional differentiation are all seen as necessary if the Third World is to develop in an environmentally acceptable way. Their persistence is not surprising; they survive in the First World environmentalism as well. This can be seen in the prominent contemporary controversy that exists because functional differentiation and specialised expertise have rendered ordinary people of industrialised countries incompetent in dealing with contemporary ecological and technological hazards (Beck 1992 p. 53-55; see Chapter Four earlier).

Future Critique

In re-imagining international environmental policy as political, taking into account again what has been externalised from modern accounts of environmental policy and making the political apparent, I have conducted an external critique of modernisation theory *sensu* Banuri (Chapter Two). This critique undermines the meta-narrative of modernisation theory by casting doubt on its embedded confidence in the ability of international efforts to address, through scientific reason, instrumental rationality, international cooperation and progress, the challenges posed by widespread environmental degradation.

Such critique is routinely subsumed into orthodoxy. Dalby (2003) observed that when the expansion of modernity and the acceleration of global processes of development are seen as the solution to numerous global problems, then anything that stands in the way of them is viewed as a threat to modernity. Referring to the work of environmental activists and social movements, Hornborg (1994 p. 260) expressed this phenomenon thus:

> To confront modernity through public discourse generally means to be absorbed by it... Self-reflection and self-objectification tend to mould activists according to public images of the 'environmentalist' or the 'indigenous' representative. Opposition to the ills of modernity is thus subsumed in the creation of a niche for each variant of critique, complete with formal channels for complaint and with chances of funding. There is a subtle transformation in motives as critique is progressively institutionalised and the focus is shifted from the source of indignation to the skills of self-preservation.

The question remains in my mind, about whether, given the inbuilt defensiveness of modern environmentalism, I have gone far enough in revealing and explaining its basis in hegemony, to overcome that defensiveness. Will this critique evoke responses based on counter-arguments that shore up power with reason or ones that shore up reason with power? To make this subsumation more difficult, it has become necessary to separate the critique of international environmental policy from a consideration of sustainable development. Sustainable development is itself the product of an earlier critique of modernisation theory (Chapter Two). It is time to make visible the politics of environmental policy, unravelling them from those of development. Once the strands are separated and the politics of each strand revealed, only then should they be compared. Here, then, is where future critical studies of global environmental policy should start.

In addition, the discourse through which knowledgeable environmental policy programmes combine government and science to plan a world rendered intelligible and amenable to rational management and save us from further environmental degradation, deserves further inquiry (cf. Simons 1995 p. 24, 29). My descriptions of this discourse are an invitation to further research rather than an attempt to define its rules of formation and conditions of existence *sensu* Foucault. How this knowledge/power complex arose deserves further historical research, as does the means and instrumentalities it deploys, those it targets, and the field of operation it actively constructs for its functionality. Scott's (1995) interrogation of colonial governmentality provides a useful model.

There is an enormous set of challenges awaiting if we are to understand how, in international environmental policy programmes, techniques of government combine with political rationalities (the

way of solving problems and arriving at collective decisions) to define the proper parameters of political action and the institutional framework to those limits, and to enrol countries and communities around the globe. A perusal of the International Institute for Sustainable Development's list of recent international meetings on environment and development (available at www.iisd.ca/) shows how vast and broad-ranging this policy field has become. Yet, there is little research critically analysing this burgeoning programme of environmental government. Goldman (2004; 2005), in a study of the World Bank and its water policy, has examined the knowledge production process that has become integral to large capital projects and has interrogated the political rationalities distinguishing the universal parameters of good and bad by which the Bank is usually judged. This type of scholarship is rare in the field of international environmentalism. Other fields of environmental policy besides coral reefs, and organisations other than the World Bank, deserve similar study, to understand how global truths are created and translated into global plans of action.

If environmental policy is to be better understood as an instrument of international governance that incorporates a relationship of western domination over the Third World, then its relationship with scholarship and professional environmentalism (especially in IGOs and in environmental NGOs) needs to be studied. So too does the extent of US influence on global environmental policy, which could usefully be explored within the concept of US globalisation—the US as a non-territorial empire that has its capital in Washington DC and the way that the US state has used other states to promote its own interests. Additionally, the various groups in the US influencing international policy and the tensions between these, the power of philanthropic foundations and their approach to the environment, the influence of scientific concepts in forming state policy—the way these various factors are shaping official policy and policy connections with those operating in the international sphere—all merit inquiry.

Just as the extent of human impact on nature, and the cumulative character of environmental degradation deserve further research, so too does the way in which the political rationalities of global environmental policy are being constructed. Exposing the relations of domination and hegemony in these endeavours should be the central platform of campaigns for international environmental justice.

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Appendix

Interviews Conducted, Workshops and Meetings Attended

Semi-structured interviews

Name	Organisation	Main subject(s)	Date
Reuben Sulu	IMR	GCRMN node co-coordinator	21 February 2003
Semisi Meo	IAS	FLMMA project with Yavusa Navakavu	27 February 2003
Alifereti Tawake	IAS	BCN, FLMMA	3 March 2003
Sandeep Kaur Singh	Department of Environment	IWP project in Fiji	5 March 2003
Isoa Korovulavula	IAS	FLMMA; SPACHEE involvement in BCN	7 March 2003
Bill Aalbersberg	IAS	BCN, FLMMA; Coral Coast ICM project	12 March 2003; 13 October 2003
Etika Rupeni	WWF-Fiji	Fiji country programme; FLMMA	18 March 2003
Veena Nair	WWF-Fiji	Fiji Barrier Reef eco-region programme	20 March 2003
Helen Sykes and Stuart Gow	Resort Support	Reef Check in Fiji	27 March 2003
Austin Bowden-Kerby	PCDF	Coral Gardens project	2 April 2003
Tamsin Vuetilovoni	WWF-SP	WWF-SP's policy	9 April 2003
Natasha Stacey	SPREP	IWP- social aspects	2 May 2003
Mary Power	SPREP	SPREP's coastal and marine activities; ICRAN	6 May 2003
Drew Wright	SPREP	IWP	9 May 2003
Wana Sivoi	PCDF	PCDF's work with villages on coastal issues	20 May 2003
Jackie Frizelle	NZAID	NZAID strategies	18 June 2003
Joshua Mael	Forum Secretariat	Their marine ornamentals project	26 September 2003
Ed Lovell	Biological Consultants	Fiji's coral and ornamentals trade	7 October 2003
Epeli Nasome	Department of Environment	GoF and climate change	14 October 2003
Hugh Govan	FSPI	SMART and Darwin Initiative projects	19 October 2003
Michelle Lam	MAC	MAC certification	24 October 2003
Rob Parry Jones	TRAFFIC	TRAFFIC and the coral trade	30 October 2003
Priti Singh	Fisheries Division	Fisheries Division: trade in coral and marine ornamentals	7 November 2003

Name	Organisation	Main subject(s)	Date
Sunia Waqainabete	Fisheries Division	FLMMA	18 November 2003
Russell Howarth	SOPAC	SOPAC's work and its role in developing regional policy	18 November 2003
Ken Mackay	C-SPODP	C-SPODP; involvement with marine aquarium trade	19 November 2003
Rex Horoi	FSPI	FSPI; regional Pacific agencies	11 December 2003
Dermot O'Gorman	WWF-SP	WWF culture and policy processes	20 January 2004
Josefa Sania	Ministry of Finance and National Planning	National assessment report for BPoA+10	22 January 2004
Manoa Malani	Tourism Dept.	Coral reef degradation as a policy issue	10 February 2004

Discussions

Name	Organisation	Main subject(s)	Date
Ledua Ovasisi	Fisheries Division	Fisheries Division and LRFFT	21 November 2003
Ross Macfarlane	NZAID	NZAID and regional agencies	18 June 2003
Nik Kiddle	NZ MFAT	NZ foreign policy on environmental matters in the Pacific	30 June 2003
Lisette Wilson	WWF-SP	WWF-SP's marine projects	5 March 2003
Suliana Siwatibau	FSPI	FSPI generally	5 March 2003
Ilisapeci Neitoga	Department of Environment	Climate change projects and reports	9 October 2003
Lionel Gibson	FSPI	FSPI and regional Pacific agencies	Late Oct. 2003
Seru Batibasaga	Fisheries Division	ICM and Fisheries Division	21 Nov 2003
Lynette Kumar	IMR	WorldFish Centre workshop on ReefBase; GCRMN	Various including 22 January 2004
Jeff Kinch	FSPI/MAC	Conservation NGOs	16 February 2004
Satui Benton	SPREP	Availability of environmental information in the region	April/May 2003
Cameron Hay	IMR, MSP	GCRMN; MSP teaching, coral bleaching in Fiji	various

Workshops and meetings attended

SPC LRFFT workshop, Suva, September 2002

MAC national workshop, Suva, October 2002

Heads of Fisheries meeting, SPC, Nouméa, August 2003

WWF-South Pacific FIME workshop, Suva, December 2003

Pacific Islands Regional Oceans Forum, Suva, February 2004